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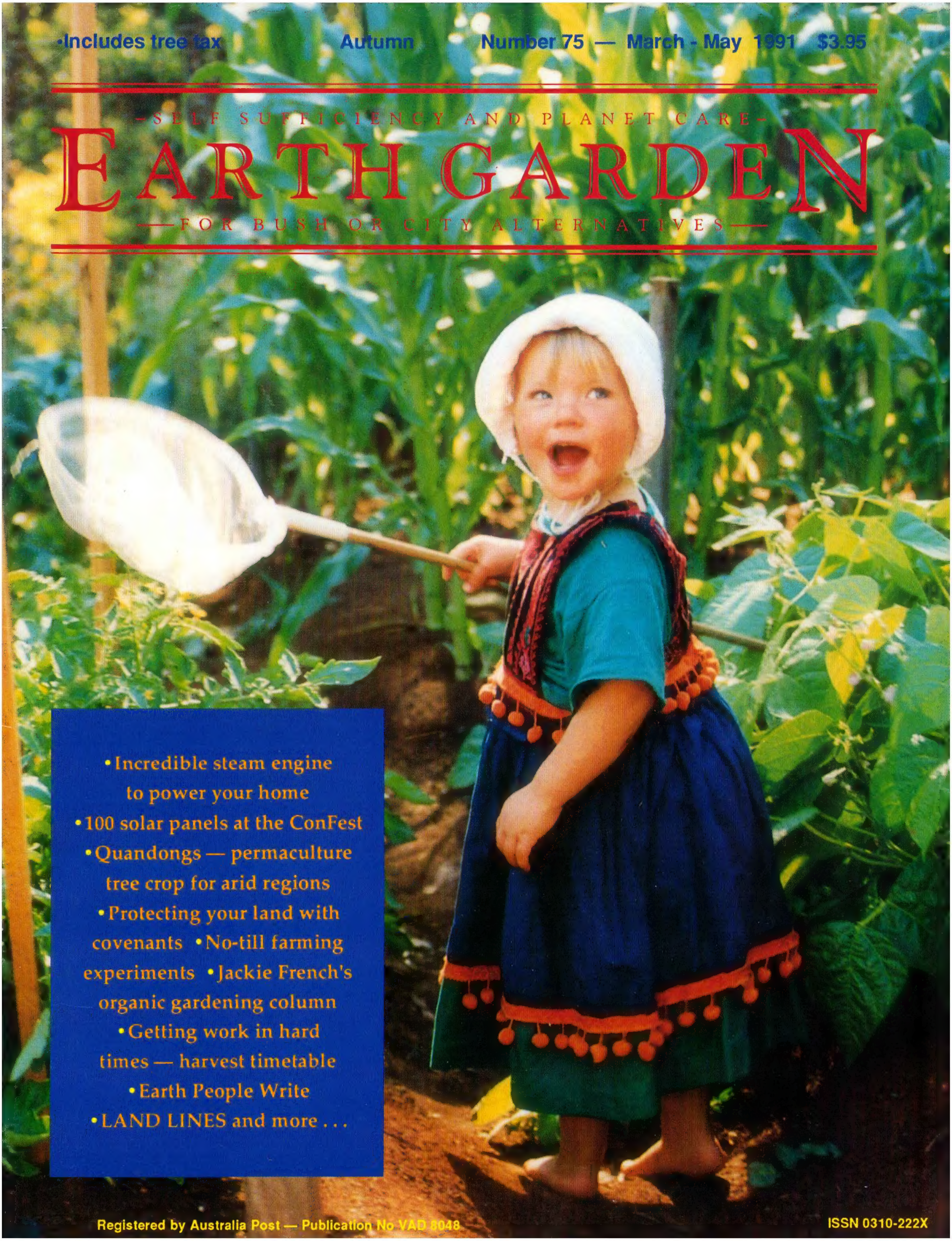
—SELF SUFFICIENCY AND PLANET CARE—

EARTH GARDEN

—FOR BUSH OR CITY ALTERNATIVES—



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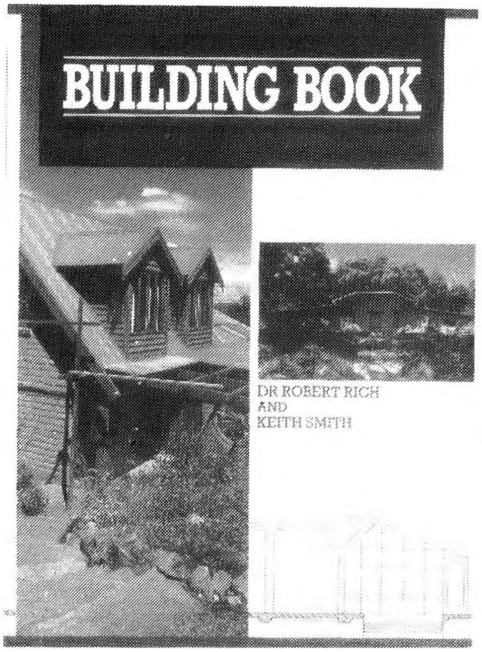

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Nelson, 1987, 315 pages, illustrated, large format paperback.

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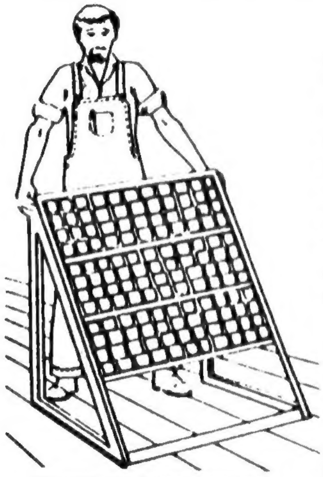
These sturdy magazine binders have been produced to protect your collection of Earth Gardens. Each binder snugly holds 12 copies of Earth Garden and prevents tears, dog ears and bent pages. They're tough, and they look attractive on your bookshelf with the Earth Garden name and logo stamped in gold foil on the spine and cover. See page 56 to order.



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By Keith Smith

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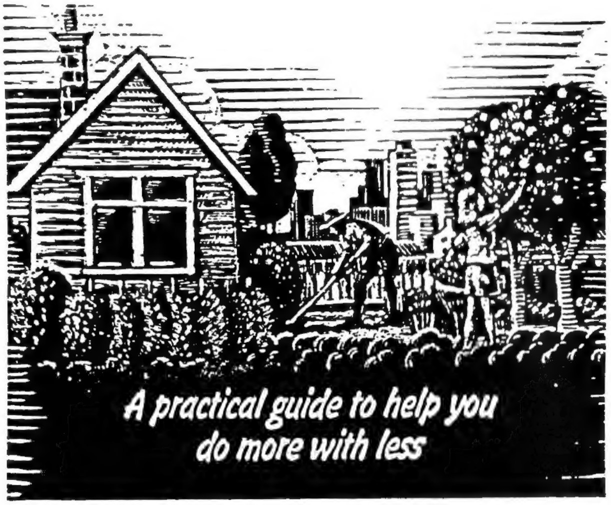
Why spend the rest of your life paying someone else for your electricity? Here's how to plug in the renewable energy of the sun, wind or water using an efficient 12V or 240V solar electric system, wind generator or water turbine. Run lights, radio, TV, computers, tools and appliances wherever you live.

"The major part of this book is devoted to practical issues, hardware and actual installations.

". . . This book should appeal to anyone wth an interest in the supply of energy to weekenders, farms or other remote dwellings or even to the suburban household." — Dr C. J. L. Cornish of Murdoch University, WA, in *APACE WA Newletter*.


A practical guide to help you do more with less

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Keith and Irene Smith

A new, revised editon of The Hard Times Handbook is now available. As we enter the last decade of the Twentieth Century major changes in Australia's economic and social life are taking place. Unemployment, inflation and high interest rates continue to make times hard, no matter what our personal situation. The book includes over 180 practical household tips, over 150 recipes for cheap, healthy meals, how to make your own supplies, grow your own food and be prepared for emergencies. The German edition of this book sold like hotcakes! See page 56 to order. $13 posted.

-SELF SUFFICIENCY AND PLANET CARE-

EARTH GARDEN

—FOR BUSH OR CITY ALTERNATIVES—

Number 75
March - May 1991

•Front Cover. Natural pest control! Two year old Lily Falconer of Woodend in Victoria, busy catching cabbage moths in the Earth Garden vegie patch. We caught 31 cabbage moths in 15 minutes.

•Back Cover. The superbly serene 'Temple Of All Faiths' for meditation and yoga, with water-pumping windmills, at the Ontos Health Retreat Centre in East Gippsland (see page 19).

•This month's tree tax will be donated to the Bellingen Valley Rainforest Nursery for helping to rehabilitate degraded rainforest regions in northern NSW.

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Founded by Keith & Irene Smith, 1972.

Editor: Alan Thomas
Assistant Editor: Greg Simmons
Secretary: Karen Sandow
Gardening Columnist: Jackie French
Book Review Editor: Sophie Masson
Illustrations: Bronwyn Halls.

EARTH GARDEN is Australia's original journal of self sufficiency and alternatives. It is intended as a forum of practical ideas, shared knowledge, sources and as a guide to alternatives to unfulfilling consumerist lifestyles.

It's about putting a roof over your head, growing your own food organically, aiming for appropriate, renewable home energy systems and surviving — and thriving — in the city or the bush, with the inner changes which follow when you're in harmony with Nature.

Each issue we donate a portion of the cover price to a community group involved in tree planting or forest conservation projects to help balance the use of the partly recycled paper used for printing Earth Garden. We would like to see all publishers pay a tree tax.

Contributions to Earth Garden are welcome — sharing information and experiences with other readers strengthens the network of Earth Gardeners. Photos, illustrations and diagrams are important when sending us contributions. Remember subscribers are sustainers — for subscription details see page 56.

We welcome advertisements appropriate to the aims and ideals of Earth Garden, but reserve the right to refuse ads at our discretion. Write to us for display rates.

Printed by Industrial Printing & Publicity, 122 Dover St, Richmond, Victoria, 3121, thanks to Alby, Geoff, John, Clarence and all the crew.

Distributed to newsagents by Gordon & Gotch Ltd, Melbourne.

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Dear readers,

Welcome to the autumn edition of Earth Garden. We're pretty pleased with this edition, and hope you enjoy the range and type of stories we're presenting. I must apologise for the previous edition being late to some people. I've had a hand this month producing Earth Garden from an old friend and workmate, Greg Simmons, who's Kombi just managed the trip down to Trentham from near Nimbin.

I've found it particularly exciting writing about Rod Muller's steam engines (see page 12). At this year's ConFest I saw his wonderful machine in action, and I fell in love immediately. I feel a bit like 'Toad of Toad Hall', as my brother James, and various other friends roll their eyeballs and say, *"Yes,* Alan, you *have* told me about the steam engine!"

In the midst of such awe-inspiring applications of renewable energy systems at the ConFest by the Rainbow Power Company and Strath Steam, I found it fascinating to read a little piece of information which the RPC had reprinted from the World Resources Institute about the issue of solar versus nuclear energy.

The allure of nuclear power is that small quantities of fuel can produce large quantities of energy. Cycled through fast breeder reactors (the most efficient nuclear technology), a single gram of uranium can produce 3,800 kWh of electricity. However, a uranium atom can only be fissioned once, whereas a silicon solar cell can absorb photons repeatedly and convert them to electricity.

Over its lifetime in 15 percent efficient thin film PV solar cells, one gram of silicon produces 3,300 kWh of electricity. Thus, gram for gram, silicon and uranium produce comparable amounts of electricity, and silicon is 5,000 times more abundant in the Earth's crust. There — tuck that little gem away for a rainy day argument!

The little girl on this month's cover, Lily Falconer, is the daughter of good friends, Doug and Steph. The corn in the background provided some of the raw material for all of us to have a birthday party for Steph combined with an "organic harvest party". It was a wonderful way to celebrate a very satisfying summer season of vegetable growing at home here in the bush.

There's nothing to compare to the excitement and satisfaction of a vegetable garden flourishing before your eyes.

This year's ConFest was interesting and relaxing, but there seems to be a disturbing drift towards more interest in alcohol and other intoxicants, than the philosophies and aims of the ConFest.

Maybe it's time for the organisers, Down To Earth, to make it open only to people who've been DTE members for the four to six months before the ConFest, and who've bought prepaid tickets.

The problem with this of course, is that it decreases the audience of new people exposed to the many wonderful, eye-opening aspects of ConFests, and could be branded elitist, not to mention inconvenient to the many genuine people who buy last-minute tickets. How do you ban intoxicants and enforce the ban? If you have any ideas or comments on these issues, DTE would like to hear from you, and you can write to them at 247 Flinders Lane, Melbourne, 3000; phone (03) 654 4521.

On New Year's morning at the ConFest, a girl of about 18 talked to me while we were gathering our clothes at the showers.

"Did you get out of it last night?" she asked me dreamily.

"No . . . I must be getting a bit long in the tooth. Anyway, I reckon there are much better things to do," I replied.

"Yeah?" she asked, surprised. "Like what?"

"Well, I can think of three straight away."

"What are they?" she asked.

"I'd say . . . love, children and gardening," I replied.

"Oh wow! That's really far out! I've gotta tell that to the others!" she cried, flapping off into the bush back to camp.

If you can get one, two, or even all three of these things together, life's pretty good, isn't it?

Happy reading,

Alan.

Earth People Write

Earth People Write is an open forum. The views expressed in letters from readers do not necessarily reflect the opinions of Earth Garden. Letters to Earth Garden are always very welcome.

Earth Gardeners visiting Tasmania

Dear Alan,

What a great mag. It allows like-minded, earthy-type people to have a forum to discuss things of interest. Included is money for a full set of Earth Garden magazines. It should keep me in reading for some months.

A big hi to fellow readers in Tasmania. A mate and I will be joining you in the middle of 1991, to create our own type of EG existence.

We'll be coming over for a short holiday in about March to see what is available and where. Any advice would be of assistance. Keep up the good work. Regards,

Jim Jeffery, 61 Keble St, Corinda, Queensland, 4075.

Soya milk cheese

Dear Earth Garden,

I am after information on making cheese from soya milk. I make my own tofu (bean curd), and I think it would be a simple step to go to cheese from tofu. The problem is I don't know what to put in the milk to give it a cheese-like taste. Could any readers please help me with this? Yours,

Ian A Brown, M/S 659B, Proserpine, Queensland, 4800.

US organic gardeners

Dear Alan,

I am sorry to hear that one of my favourite magazines has been cut back to four issues per year, but still, it can't be helped.

However, I need some help. I wrote to Rodale's *Organic Gardening* magazine with a query and they printed my address. I have received many replies from their readers, all wanting to exchange organic gardening, wildlife, or craft magazines with Aussies and Kiwis. So if any readers want a US penfriend and can send me a stamped self addressed envelope, I'll be compiling a list of names and addresses shortly.

Shirley Svensson, 520 Musgrove Rd, Coopers Plains, Queensland, 4108.

New subscriber

Dear people at Earth Garden,

This letter has been a long time coming, but here it is, finally! We just want to thank you for the great work you do in putting together such an eminently practical and motivating magazine. We are only beginners in this self-sufficiency game but your insights and advice are spurring us on to attempt bigger things. Many thanks!

We usually pick up odd issues of the magazine at the newsagent but now we feel it's time to subscribe to you directly.

Liz Hanlon & Martin Harding, Berowra, New South Wales.

Rural enterprise idea

Dear Earth Garden,

Firstly, many thanks for a marvellous magazine. I have eagerly looked forward to every issue since the first one, which was when I was about 18 years old!

Now that the big 40 looms on the horizon I must say that even though I have absorbed and practised an enormous amount of information, there is always more to add from your interesting articles. My husband and I are rural Victorians, and we do not own our own property so we have to rent.

We have an idea to become self employed, because regular work is not always available, even though we are experienced in small farm management and the hospitality industry. I am a chef, and we are organic gardeners.

There are buildings on many farms such as second farmhouses, workers' cottages and shearers' quarters that are not being used or well maintained as the rural crisis grows and farmers cannot afford the extra expense.

We feel we have a lot to offer someone on a long term basis by using one of these buildings as a 'Bed and Breakfast' destination which could provide us with a home and an income. It could mean caring for and even improving a neglected part of someone's property.

We are a responsible middle aged couple with one child and have possible income support to establish ourselves through NEIS (the Rural Enterprise Victoria Small Business Scheme).

We would like to help ourselves by helping someone else and would consider caretaking as part of a commitment. If anyone out there has a suitable building we have lots of energy, skills and enthusiasm and would love to discuss the possibilities. Yours faithfully,

Susie Atkinson, RMB 4116, Ararat, Victoria, 3377.

The classic wood-burning stove

Dear Alan,

We wish to sell our long loved Aga cooker which has helped us raise six children. We thought we may be able to find a good home for it with one of your readers.

J Castor, Glenbrook, New South Wales.

See the Unclassifieds section in this edition.

Curing snake skins

Dear EG editors and readers,

I've had a subscription to Earth Garden for a year now, and it is one of the few things which helps me keep my sanity while I live in a box in a nurse's home in Sydney.

Subscription time has come around again, and I don't hesitate to renew my sub. Earth Garden is for me. Although life in a nurse's home is hard — no garden, no recycling, no nuthink (but cheap), in four months I will get a place of my own. Reading EG keeps me thinking about all the good things I will be able to do, like composting and growing salad boxes and recycling and so on.

One more thing before I go and struggle with myself about whether to order all the back issues or not. Does anybody know how to cure snake skins? My grandfather has recently moved onto a block of land which seems to support an awful lot of black and brown snakes.

He fairly regularly kills them. I don't like it but if he's going to, something productive ought to be done. They've had at least one four foot black snake chasing frogs in the aboveground swimming pool.

So any suggestions would be appreciated. Glad the mag is coming in a paper envelope now, thanks.

Anna Dunbar, PO Box 691, Rozelle NSW 2039.

Worm bins

Dear Alan,

I enjoy your magazine so much and can't wait for the next. One thing I can't understand is why every organic gardener doesn't have a worm bin. You can make it of almost anything — wood, metal, bricks or cement slabs. About a metre square is a good size. A division down the middle would allow you to shift the worms as you harvest the castings. The second side should be prepared with new bedding. Horse manure is great. Put your worm bin under some trees to keep it cool.

A worm eats its own weight of food each day and produces the same weight of castings. A thousand worms weigh approximately 500 grams and can become a million in a year.

Worms can be fed fresh kitchen scraps and garbage. The worms won't eat it until it is ready. Buy a thousand worms (look in the Yellow Pages) damp down the bedding, put in the worms and cover with black plastic. Place another lid over the plastic, and lift the plastic to feed them. Feed them anything organic, and treat the worm bin as a garbage disposal unit. Castings can be harvested after two months. Worms don't like being exposed to light and dry air so when harvesting take off the black plastic and rough up the surface (a few days after their last feed). The worms will go down to escape the dry air and light. Scrape off the top down to the worms and repeat this every 15 minutes. Any worms encountered in the scraping should be dropped into the new bin. Transfer the remainder at the end.

Dig a little hole and put in a good handful of worm castings when you plant seedlings or spuds. Fill a shallow trench when you plant seeds directly (seeds germinate better in worm castings than anything else) and make a mixture of castings and sand for seed trays.

Put a mulch of good compost on top of the bed and a handful of worms from your bin and finish with a sprinkle of blood and bone. Now stand back and watch the results in amazement. Of course you would have carried out all the other chores you usually do such as preparation, weeding and watering. Lastly go to your library and obtain a few books. There are about 12 available. Yours,

Wally Harland, Bicton, Western Australia.

Dear Earth Garden,

I am enclosing my subscription for EG for a further 12 months. Thanks Alan for the inspiring and interesting information, particularly the gardening articles. Our garden is now becoming organic — with mixed success, but we're getting there! Keep up the good work.

Judy Barber, Bellbrae, Victoria.

PNG Earth Gardener invitation

Dear EG readers,

We moved here in August '90 and spent the best part of that time fixing up this old house and housing the chooks. Our vegetable garden is producing excess for sale in town, despite the problems with insects, which we are still working with.

This place is certainly paradise (not without its frustrations) with salt water fishing, diving and canoeing 200 yards away. And this month we begin to build our home alongside a crystal clear running river — great prawns. Our house will be built from poles, mudbricks and cedar shingles. Hoping all the books we've read can help. There are no building inspectors to help or hinder us. No egg Board, no fumes and no insecticides.

If there is anybody wishing to visit and fit into this wonderful lifestyle for a week, a month, or whatever, your company and help will be returned by Melanesian hospitality. Please write.

Seb is into building castles in the sky and playing music, although at the moment he is building us a bed from bamboo. Sara, 11, is studying by correspondence and although never bored, does miss company of her own age. Josh, two, is like a free range chook.

Also, if there are any EG readers experiencing the beauty and frustrations of tropical semi-self sufficiency and would like to correspond, please write. Regards,

Liz Wright, PO Box 276, Alotau, MBP, Papua New Guinea.

Harnessing a Newfoundland?

Dear editors,

As I'm sending in my subscription I thought I'd take the opportunity to see if you or your readers might be able to help me. I recently got a Newfoundland puppy and after reading a bit more about the breed I have found out that they used to be trained to harness.

Could anyone with any information on making dog harnesses or training dogs to them please write to me. Any information will be greatly appreciated and I will reimburse any postage or photocopying expenses. Thanks,

Miss L Payne, Oyster Harbour Caravan Park, Lower King, Western Australia, 6330.

Dear EG,

We are rather broke graziers learning how to go organic and really enjoy receiving you magazine. Best wishes,

Fran and Harry Bestwick, Duramana, New South Wales.

Dear Alan,

Thank you for producing such an informative and inspiring magazine. I'm only a novice Earth Gardener, but I find Earth Garden thoroughly enjoyable. Many thanks, and all the best for 1991. Regards,

Ros Bell, Kiama Downs, New South Wales.

Dear Alan,

I was in a newsagent's recently and saw a fantastic photo of Santa Claus on a camel. I had to check it out. To my surprise, it was on the cover of a self-sufficiency magazine. It was Earth Garden. It's very good.

Paul Wadsworth, Casula, New South Wales.

Dear Earth Garden,

I stumbled across my first copy of Earth Garden (EG 73) in a newsagent by chance. I found it hidden behind some other gardening magazines and on, looking inside, discovered a magazine truly worth the paper it is printed on. Keep the informative articles flowing.

Stuart Donaldson, Winston Hills, New South Wales.

Dear Alan ,

We hope you had some time off to relax and enjoy life to its fullest during the Christmas break and we wish you and the Earth Garden staff all the best for '91 and thank you for sharing a great magazine.

At the moment things are rather unsettled as we've just moved on to our 380 acre bush block with 20 x 20 ft shed, a 2,000 gallon rainwater tank and not too much else apart from a large native fraternity, but it's all ours and with no debts now it's a very nice feeling! Unfortunately our whole area is tinder dry so we were hoping for a rather wet Christmas. Patience is a virtue, something we'll need lots of.

Well, all the best for now and we eagerly await the next mag. Thanks,

Jan & Neal Franke, Gin Gin, Queensland.

Dear Alan,

Thank you for my copy of Earth Garden 74. Although an oldie now living in suburbs, I still find it helpful and entertaining.

I was also most enlightened, Alan, with your views in the editorial, especially the segment on 'Holier than thou'. I must say I fully agree with you. As for recycling, it is a way of life with me, perhaps acquired through hard times. The waste we have in today's society really angers me, but, there, I mustn't preach.

Marcus Bussey's article 'Diet for a new civilisation' was also an eye opener and I'm all for a vegetarian diet. Once again thank you and I wish you a happy new year.

Gwen Laker, Holt, ACT.

Taree Earth Gardeners?

Dear Earth Garden,

At the moment we are living in a caravan in the Sydney region and are saving up for the big move to our bush block at Nabiac. We hope to move within the year. We plan to grow most of our food (organically, of course), plant heaps of bush tucker plants, keep free-range chooks for eggs and have a couple of horses. Most of our block, however, will be left bush.

We, (Victor, Vemae and myself) are interested in Nature, conservation, health, LETS, gardening and lots more, and would love to hear from like-minded people living in the Nabiac/Taree area. Congratulations on a great magazine and regards to all,

Anne-Maree O'Shea, 269 New Line Road, Dural, New South Wales, 2158.

Organics, alternatives and yoga in US

Dear Earth Garden staff and readers,

I would like to join the many other readers in thanking you for your interesting, inspirational and supportive publication.

While I do not have the time or the space at present to become a dedicated Earth Gardener, I enjoy dabbling in a little organic gardening, making long-term plans and taking some steps towards gradually adjusting my lifestyle. Earth Garden has certainly helped me with this and it is so comforting to know that so many people are already out there making environmentally sound contributions.

My main reason for writing is to ask you, Alan, and other readers, for information about similar publications and related groups and activities in North America. I will be living in Boston, in the New England area (north east) of the United States for four months in the second half of 1991. I would like to investigate organic gardening, alternative medicine, alternative lifestyle, conservation and other environmental movements while I am there, but I have no contacts and do not know where to start. Any information or leads would be a great help. If anyone would like me to follow-up something in particular for them while I am there, I will be happy to try to help.

I am currently doing a yoga teacher training course and also hope to link up with yoga schools and centres in America. Any information would be appreciated. I'll be leaving at the end of July, so I would like to hear from people by then. You can write to the address below. Thank you again and keep up the good work everybody. Yours sincerely,
Lynn Romeo, PO Box 85, Yarraville, Victoria, 3013.

Indian runner ducks

Dear Earth Garden,

I was given a copy of your marvellous magazine while in hospital after the arrival of my youngest baby. It was the second best gift — the first was the garden fork I needed desperately (definitely a talking point among staff and visitors). We are three years down the track now after a move from Sydney to Wombat, and have not a regret in the world. The cherry harvest is finished and the plums yet to start, so it's time to sit on the verandah with wine, fruit, the latest Earth Garden, two children asleep and one raiding the cupboards.

Can anyone help with information on Indian runner ducks? I've a yearn to own some, but will they eat cherries? I have a largely unused dam, except for silver perch stocked last year, and an acute slug and snail problem in the vegie patch. Any information would be great and/or does anyone have a spare pair of ducks to sell?
Lesley Palmer, Wombat St, Wombat, New South Wales, 2585.

Fighting for vegetarianism

Dear Earth Garden,

It was a pleasure to read the article, 'Diet for a new Civilisation', in Earth Garden 74. It is about time the environmental movement started to take up the vegetarian issue instead of putting it in the too personal or too controversial basket.

In my mind vegetarianism should be a fundamental ethic for all environmentalists, Earth Gardeners, natural therapists, and New Agers — in fact, for everyone. I don't believe anyone could be deemed spiritual, environmental, peaceful or humane if they don't embrace the vegetarian ethos. Killing animals is wrong, and if some people can't understand this because of the whims of their stomach, then they have a long way to go in their ethical development.

The book *Diet for a New America*, by John Robbins, has startling facts about the consequence of diet preference on the environment and it is available in Australia from The Australian Vegetarian Society, PO Box 65, Paddington, New South Wales, 2021, priced $20. The world would be a better place if it was populated with vegetarians. Eating a non-violent diet is something we can do everyday. It is not hard, it is healthy, and it may save us all. Kind regards,
Simone Gray, Higgins, ACT.

Manufacturing tank strainers

Dear Alan,

We moved to our 15.5 hectares seven years ago and we really enjoy living here. We keep ducks, fowls, cows and sheep (all in small numbers), and I keep a couple of pigs to fatten for our pork supply. We also have a vegetable garden and an orchard, and although they're not large, their produce helps our economy along.

We run a business from our workshop, and although it was hard for the first couple of years getting established, it now affords us a reasonable living. We manufacture tank strainers (see Unclassifieds). Jim makes and maintains the machines, I do the bookwork. We have retained a lot of the trees on the property and planted countless native ones. The soil is very sandy and takes time and effort to enrich.

We have enjoyed Earth Garden for a number of years, and think the tree tax is a good idea. Enclosed is our subscription for this year. Kind regards,
Ellwyn Barnsley, Warwick, Queensland.

Well, who knows . . . .?

Dear all,

Enclosed please find our subscription for another year's worth of Earth Garden. Keep up the good work. Since we wrote to you last, we have been very busy — not to mention being flooded three times and evacuated once last year!

We decided to make use of an old shed on our property which just happens to be on what we loosely call the main road. Some days we might get 15 cars travelling along it. Once we started revamping the 'old shed', it turned out to be old timbers covered with tin. So we spruced up the outside and decided to open it as a small handicrafts and art gallery.

Most of the work is our own, and includes oil paintings, jewellery, leather work, pottery — fired in our home-built, wood-fired kiln — wood turning and carving, and painted porcelain. Since we opened in September, we have been inundated by locals who do handicrafts and who need an outlet. As a result, we now have a good range of what we call 'genuine handicrafts' (no 'Made in Taiwan' here).

We also branched out into beekeeping and we sell our own honey. Our chooks are co-operating beautifully so we sell free-range eggs as well as seasonal organic vegetables (though these can be hampered by lack of water). We also started stocking soft drinks and ice creams and erected some tables under our lovely shady peppercorn tree for people to use and enjoy a cup of tea or coffee. There are no shops for at least 13 km in either direction.

We also have a wide range of coloured fleeces for spinners. The colours range from pale caramel, through the greys to black from all breeds of sheep, including Romney, Perendale, Corriedale, Morrit and crossbreeds. We used original timbers as much as possible in the restoration of the shed. When these ran out, we stretched hessian over frames and painted it with a mixture of papier-maché and paint.

It looks great and fits in with the rest of the décor. We still have to finish the workshop behind the shop but so far the whole venture has turned out to be quite successful, albeit on a small scale.

We are open seven days a week (no one gets anywhere without hard work), and, because we are usually working at various projects in the workshop, at least one of us is here all the time.

In the midst of all this we are digging a well in the garden. We plan to line it near the top with railway sleepers and that part is almost done. The problem now is how to shore up the sides while we're digging the well because we are now down about ten feet with about another five to go and the soil is softer.

Has anyone out there any ideas (cheap ones), or does anyone who has dug a well have any useful hints or ideas? All help would be greatly appreciated.

Fellow Earth Gardeners are more than welcome to visit our shop. We are on the Grenfell to Quandialla road, 34 km south west of Grenfell and 50 km north west of Young.

Incidentally the building (the 'old shed') turned out to be the barber's shop when Bimbi was a bigger place! All the best,

Colin & Pam Upton, Peppercorn Farm, Bimbi via Grenfell, New South Wales, 2810.

Recycling newspaper?

Dear Alan,

Do any readers have any creative ways large quantities of newspaper can be recycled, preferably using low technology in local areas to minimise transport costs? Is there up-to-date information on recycled paper based mulches, weed mats and plant pots?

Harry Johnson, Recycling and Pre-Vocational Co-ordinator, Aspley Special School Recycling Station, Aspley, Queensland, 4034; phone (07) 263 2655.

Pointing our way

Dear EG,

I discovered your magazine by accident — and am really pleased that I did.

Thank you for all the interesting information and hints. I especially like Jackie French's column — she's a gardener after my own heart.

I work on a resort in Queensland as a gardener and must say it is sometimes difficult to get away with doing all my gardening organically — but I am slowly making them see my way.

Anyway, keep up the good work.

Karyn Plapp, Queensland.

NZ Earth Gardener making the break to the wild West Coast

Dear Alan,

Many thanks for the sub renewal form. I have left the city of Christchurch, and have purchased a house on the West Coast of the South Island.

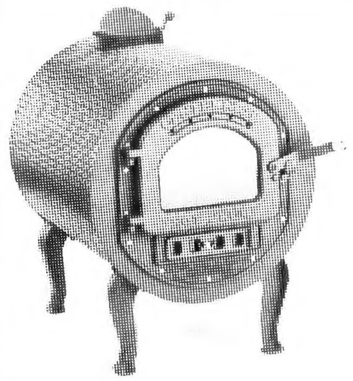
I'm looking forward to having a go alone and already have one British Alpine goat doing her thing on my section.

We have kept rabbits for some time and I am hopeful of greater things for me and them.

Your articles are very good and I wouldn't be without any of them.

Yours sincerely,

Shirley Keown, Stillwater, West Coast, South Island, New Zealand.



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Power to the people

THE LARGEST gathering of people in the world to be powered by solar energy. That's how the Rainbow Power Company (RPC) described the Down To Earth ConFest at Walwa on the upper Murray River, from 29 December to 2 January this year.

One hundred 56 watt photovoltaic solar panels provided enough electricity for the lighting, refrigeration, camping facilities and music equipment for the 5000 ConFest participants and stall holders.

Many people were attracted to the huge display of PV panels soaking up the photons in the 40 °C plus temperatures, to learn from RPC people such as Peter Pedals about the practicalities, politics, and possibilities of setting up independent home energy systems. During such workshops city-based ConFesters were also able to learn of energy conservation methods and attitudes towards energy consumption which people with independent energy systems consider as a matter of course.

The $50,000 worth of solar energy equipment was supplemented by pumping power provided by Rod Muller of Strath Steam in South Australia, who was invited by the RPC to help at the ConFest. Strath Steam's intriguing steam engines (see story elsewhere in this issue) provided vital assistance in pumping around 104,000 litres of river water a day through the kilometres of polypipe laid about the ConFest site for showers, washing and cleaning.

Two trailer sized cool-rooms were the biggest single energy consumer and water pumping the second largest demand. Of the 100 solar panels powering the entire festival, 60 were needed just to supply enough power to operate the cool rooms effectively. It may be that at future ConFests ice trucked every day to the site would be a more energy-efficient way to reduce energy demand.

Providing solar energy to power the ConFest cost the organisers, Down To Earth, four or five times the previous budgets for electricity but the choice between smelly, polluting and non-renewable diesel generators, and the silent and exciting solar and steam combination was simple. The ConFest energy choices were between the past and the future.

"We were all very impressed with the way the ConFest went," said the RPC's Dave Christmas.

Solar panels

100 Solarex 56 watt panels were used with a total wattage of 6000 watts. With some manual tracking of the panels, some 50,000 watt hours of power were produced daily. 6000 amp hours of battery storage arranged under the solar arrays then supplied the power to the festival and met the varying demands during each day. The battery power was inverted and reticulated as a standard 240 volt supply.

Batteries

Ex-Telecom batteries were used due to their rela-

RPC's 100 solar panels set-up in the middle of the festival site to provide power for 5,000 people.

tively low cost and high storage capacity. Seventy-two cells at two volts and 500 amp hours of capacity were supplied. These cells were divided into a number of battery banks: 1 x 48 volt for water pumping; 1 x 48 volt for refrigeration; 1 x 24 volt for lighting and 1 x 12 volt for audio visual, First Aid and the stage areas.

Inverters

RPC used several inverters to convert the low voltage battery power to 240 volts. Siemens Pty Ltd provided a 4000 watt sine wave inverter to run both the cool rooms. A Magnum 4000 (1200 watt inverter) ran the 240 volt lighting and fridge circuit. RPC sine wave inverters (rated at 300 watts) powered the audio visual, stage and First Aid tents (see the story following).

Water pumping

Water for showers was provided by a C550B centrifugal pump which delivers 200 litres per minute at six metres of head. It draws nine amps at 48 volts. A Rule 3500 submersible pump, which can supply 60 litres per minute at six metres of head and draws nine amps at 24 volts, was used for back-up supply. Garden hoses were pressurised at the steam generator and Rainbow Power stall for fire prevention and emergencies.

Hybrid fluorescent lighting

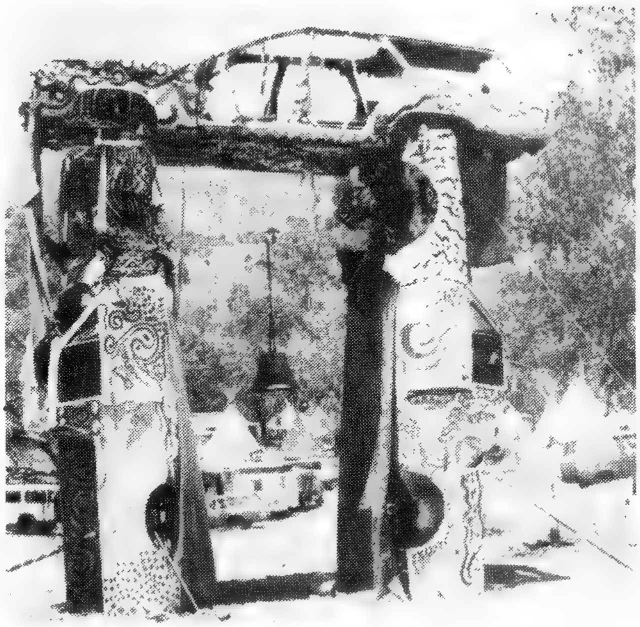
To minimise the power demand for lighting each stall was provided with high efficiency PL lights. A 13 watt PL lamp provides as much light as a 75 watt incandescent globe. Using one 13 watt compact fluorescent lamp instead of a 75 watt incandescent globe can reduce electricity consumption by around 480 kWh over its lifetime (8000 burning hours). This works out as a saving of about $58 at 12 cents per kWh, plus around 460 kg of CO_2 if your electricity is from a coal fired power station.

Even given the apparently high purchase price of these lamps, they should pay for themselves in lower bills. If their use becomes widespread, they have the potential to reduce the demand for electricity in peak consumption periods and significantly reduce the amount of CO_2 released into the atmosphere. Compared to the candle, a PL lamp emits 100 times more light, is about 1,333 times longer lived, and over its 10,000 hour lifetime, it will produce the same amount of light as that from about 133,000 candles.

Steam generator

This 'old' technology has been revitalised and made available by Rod Muller of Strath Steam. The steam engine was mainly connected to a 100 amp ex-military generator This power charged the batteries used for water pumping.

"The demand for water greatly exceeded our expectations, so it's been a Godsend to have Rod's steam engine for back-up," said Terry McGovern from the RPC.



'Car-Henge': this junk sculpture was built by a British performing arts group, and became a focus for the New Year's Eve ConFest party.

Site layout

The RPC laid out kilometres of electrical cable around the ConFest site to reach the far flung market stalls, food stalls and music areas.

ConFest activities

ConFesters this year were able to enjoy the usual range of demonstrations, workshops, group activities and range of crafts, food and books which have helped to make the ConFest a unique and lively annual event for thousands of people from all parts of Australia. This year there was less emphasis on high-powered, professional music entertainment and greater emphasis on smaller music stage areas, with improvised performances from those attending the ConFest, rather than people paid to appear and perform.

The New Year's Eve party proved to be an exciting event with thunderstorms, lightning and rain to accompany the chanting, dancing and singing. A focus for the party was 'Car-Henge' — a dead-car-body sculpture executed by members of a touring British performing arts group.

Another development this year was greater emphasis on the children's village — a space set aside for family groups to camp to alleviate the conflicting wishes of partygoers and sleeping children.

ConFest bargains

After the ConFest, energy equipment was available at bargain prices. The RPC sold the 56 watt panels at $470 each, 1200 watt inverters at $1100, and the new RPC sine wave inverter was selling at $565.

~ Sine wave inverter ~

Peter Pedals leading a workshop on independent home power systems at the ConFest.

THE RPC has recently developed its own sine wave inverter for independent home energy systems. One of the problems with previous inverters on the market has been their inability to replicate faithfully the sine wave pattern of AC power supplies, causing problems for some electrical appliances. The closest approximation in the past has been a 'stepped sine wave' inverter (with a pattern resembling a jagged-edged sine wave).

The RPC sine wave inverter now joins two other inverters on the market in reducing this problem. The RPC inverter sells for $630.

Sine wave and square wave electricity

The power drawn from a battery bank is DC (direct current). The 240 volt mains power supplied by the electricity grid is AC (alternating current).

The power created by many inverters is 240 volt AC, but will not be exactly the same as the electricity available via an electricity authority. AC electricity as supplied in Australia reverses in direction 50 times per second and does so with a constantly varying force, surging forwards, slowing to a stop, surging in reverse, slowing to a stop and surging forwards again. This steady increase and decrease in force as the current changes from forwards to reverse and to forwards again is referred to as 'sine wave'.

Most solid state inverters produce 'square wave', 'modified square wave' or 'stepped wave' electricity.

Square wave is the term used when the electricity has a constant force, such as it has with DC, but switches direction more or less instantly at the same kind of frequency as the normal grid supply (at 50 times per second).

Modified square wave or stepped wave is where the force of the electricity increases and decreases in a series of small steps in between changing direction. Each one of these steps has a constant force which is then instantly switched to the next step of either greater or lesser force, and in so doing approximates more closely a sine wave than does the square wave.

Different appliances will be affected to greater and lesser degrees by the different forms of AC. Resistive and universal motor loads will be unaffected. Resistive loads are found in incandescent light bulbs and heat-producing appliances such as kettles, jugs, irons, radiators and stoves. Universal motors with brushes and commutators are found in most hand tools and many kitchen appliances such as food processors, blenders and centrifugal type juice extractors.

Inductive loads may run with a little more noise and get warmer. Inductive loads are found in voltage transformers and motors like those often found in refrigerators, freezers and washing machines. Induction motors also need a comparatively high surge current to start up.

Some appliances will run noticeably less well on square and stepped wave AC than on pure sine wave. Those affected include:

- some of the latest sewing machines
- microwave ovens (which operate more slowly)
- some battery chargers (including some cordless appliances)
- some dimmer switches
- some digital clocks
- some variable speed devices such as fans
- sound equipment (radios, amps, TVs).

Some devices will operate better with the installation of a line conditioner on the inverter. There may also be less costly and more effective ways of running certain appliances than by using an inverter.

More energy-efficient

More appliances run more efficiently on a 240 volt electrical power source that produces a sine wave. Induction motors in particular use much less power.

Protects your equipment

A sine wave inverter will ensure that both your peak voltage and average (mean) voltage are correct for your equipment. Square-wave and stepped-wave power can cause premature appliance failure due to arcing, stress and overheating.

Incorrect wave form, incorrect peak voltage or incorrect mean voltage are three reasons why equipment may fail to run from a square-wave or stepped-wave and the harmonics and spikes may also cause problems.

Sound systems

A sine wave inverter is ideal for running hi-fi, sound and video equipment because it will not produce the annoying hum or buzz so often associated with sound equipment powered by an inverter. A sine wave inverter is recommended for variable speed motors in sewing machines and other appliances, and for sensitive electronic equipment.

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Steaming back to the future . . .

by Alan Thomas

Trentham, Victoria.

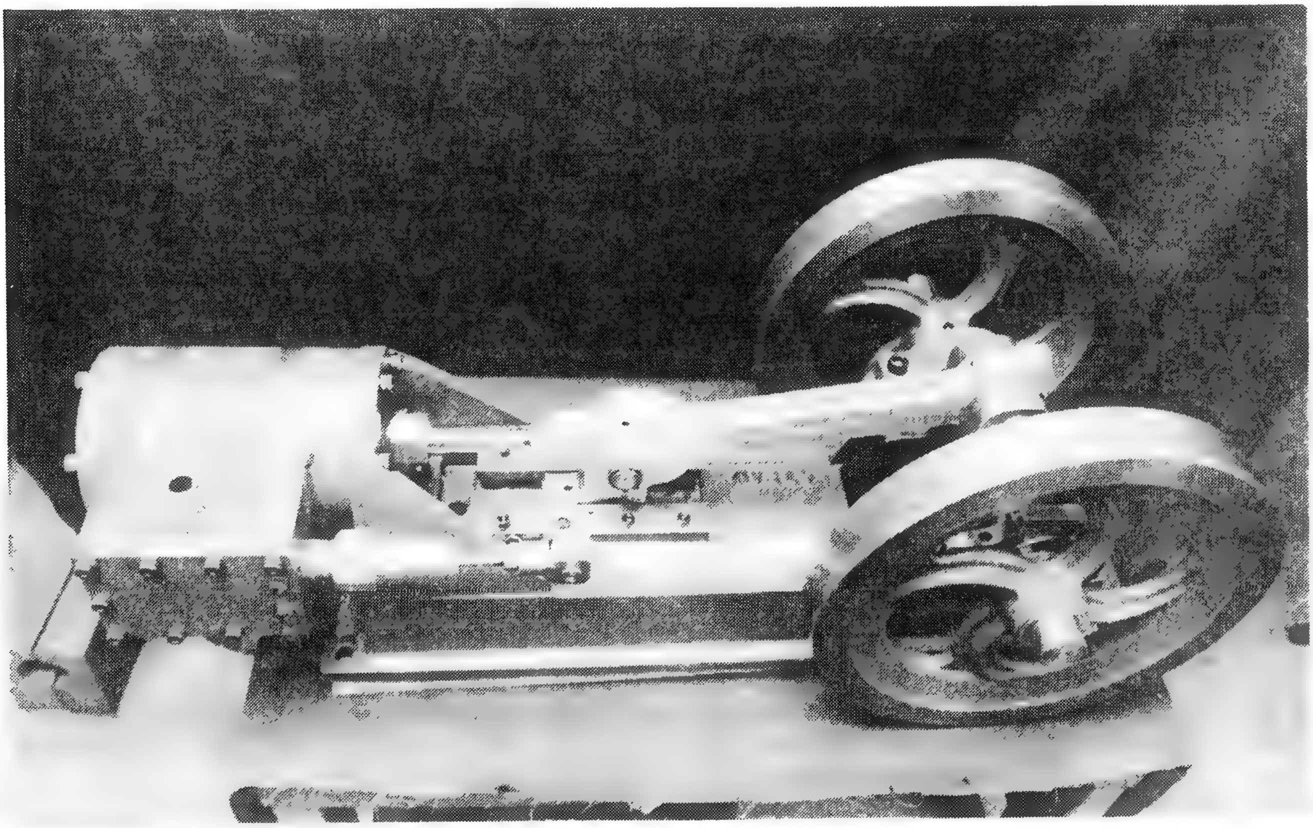
A STEAM engine which saw its public debut among alternative energy followers at the recent Down to Earth ConFest may prove to be one of Australia's most significant breakthroughs ever in environmentally friendly, appropriate home energy systems.

Strath Steam's Rod Muller developed the 4 to 5 horsepower and 10 hp steam engines through his engineering workshop at Strathalbyn in South Australia. While initially directing the engines towards the marine market, Rod is now turning his attention to home energy applications as well, after realising that steam engines could provide the perfect answer for people needing power systems in areas remote from mains electricity.

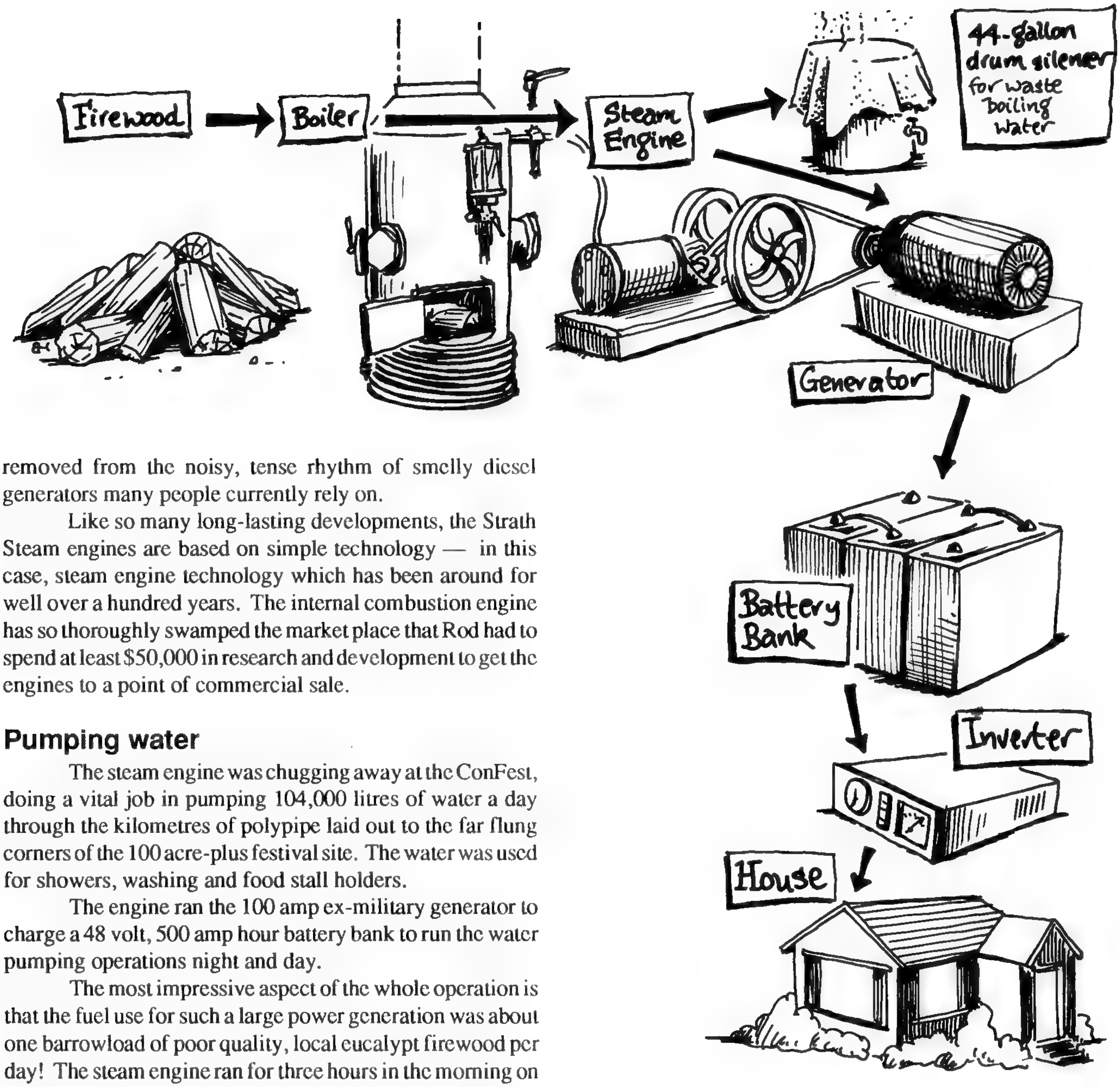
Rod is reputed to be the only commercial manufacturer of steam engines in Australia. He is a lively, friendly person whose genuine enthusiasm for the steam engine is infectious. He got on well with the people from the Rainbow Power Company and is the sort of person who makes it a pleasure to be involved with helping to promote appropriate technology.

It seems to me, after seeing his steam engine operating 'in the flesh' at the ConFest, that the potential is enormous. I was overwhelmingly impressed with the smooth, quiet operation of the engine, the simplicity of the design and the environmentally-friendly applications, as well as its large electrical generating capacity when hooked up to a generator.

I walked down to the (Murray) riverbank one day at the ConFest, where Rod had his 4 to 5 hp model (the 'Liberty') set up to charge a 48 volt battery bank, via an ex-military 100 amp generator. The steady, quiet 'pump-pump-pump' of the steam engine has a pleasant effect on you, far



The 4 to 5 horsepower 'Liberty' steam engine — yesterday's technology today.



removed from the noisy, tense rhythm of smelly diesel generators many people currently rely on.

Like so many long-lasting developments, the Strath Steam engines are based on simple technology — in this case, steam engine technology which has been around for well over a hundred years. The internal combustion engine has so thoroughly swamped the market place that Rod had to spend at least $50,000 in research and development to get the engines to a point of commercial sale.

Pumping water

The steam engine was chugging away at the ConFest, doing a vital job in pumping 104,000 litres of water a day through the kilometres of polypipe laid out to the far flung corners of the 100 acre-plus festival site. The water was used for showers, washing and food stall holders.

The engine ran the 100 amp ex-military generator to charge a 48 volt, 500 amp hour battery bank to run the water pumping operations night and day.

The most impressive aspect of the whole operation is that the fuel use for such a large power generation was about one barrowload of poor quality, local eucalypt firewood per day! The steam engine ran for three hours in the morning on half a barrowload of firewood. When the sun was fully charging the Rainbow Power Company's 100 solar panels, the steam engine's generating capacity was not essential.

In the early evening when the sun was no longer face-on to the PV panels, Rod would restart the steam engine, recharging the battery banks for another three hours — say from 6:30 pm to 9:30 pm, again, on just a half barrowload of firewood.

When I saw the engine running, it was quietly working away at only 500 rpm, yet generating approximately 23 amps on half throttle!

Domestic applications

The twin solar and steam set-up at the ConFest can be seen as a scaled up version of applying the system to a small community, large household or outback homestead. The 4 to 5 hp steam engine can easily be hooked up to (for example) a 45 amp car alternator. A range of boilers can be used, with local firewood the obvious fuel choice for most Earth Gardeners.

"Such a set-up means, in simple terms, that for a low energy-requirement house, you might need to run the steam engine for only a couple of hours a day," says Rod Muller.

Up to three homes could be powered by one 4 to 5 hp engine without any strain, and the beauty of these inspiring engines is that their range of applications is enormous.

"If you set up the engine in a small shed near the house, you could provide all your electricity needs. You could also centrally heat your home, provide all your hot water needs, run a small wood cutting mill, a sheep shearing shed, winches, pumps and an air compressor. You could even run a sauna from it," says Rod.

Rod sees the ideal home power set-up as including several PV solar panels, with the steam engine as the primary energy source for such a hybrid system. The steam engine would be most useful for people with access to their own woodlot, or a cheap firewood source, probably living in the colder, more forested regions of the country.

Engine specifications

Bedplate length — 570 mm
Overall length — 725 mm
Bedplate width — 200 mm
Overall width — 300 mm
Overall height — 290 mm
Boiler heating area — approx 40 sq ft
Boiler pressure — 110 psi
Engine weight — 130 lbs
Boiler weight — 650 lbs
Drive shaft diameter — 30 mm.

Although Rod says that a smaller 2 hp steam engine is "on the drawing board" it would cost almost as much to manufacture as the Liberty 4 to 5 hp engine.

"It wouldn't be much cheaper, and you still have to go through all the Government red tape to get it on the market," says Rod.

Even though the 4 to 5 hp engine can provide the power requirements of up to three houses, Rod believes that the best arrangement for a single home is simply to "run the Liberty slower, burning less wood".

"It's like owning a V8, and being gentle on the accelerator," he says.

A typical daily routine for the average property might follow the following pattern.

"You might light it up in the late afternoon and run it from, say, 5:30 pm till 10:30 pm. It would recharge your battery bank and reheat your hot water service. You could then use the boiler heat to heat your home throughout the evening."

"So, on an average night in winter you might use half to three-quarters of a barrowload of firewood, depending on the quality of the wood and how hard you run the engine," says Rod.

In winter, the system would provide your heating requirements. In summer, obviously the time of year when solar panels are most effective, but when electricity needs are lower, the steam engine could supplement the PV panels.

Environmentally friendly

In the simple words of Peter Pedals, "Whether you're on a mains grid or alternative system, you need to burn fuel for heat." Fossil fuels, such as oil and gas, are non-renewable, and the huge power stations built to provide our mains electricity have massive construction costs. Even with hydro power stations, massive environmental damage usually accompanies their construction.

Firewood can be the best fuel *if* you have access to a renewable source and aren't contributing to forest destruction. For instance, if you plant tree seedlings on your land to replace the firewood you use, within six years or so you can have a self-sustaining woodlot. Or, if you use the dead limbs that have fallen from trees in your forest, firewood is again an environmentally benign fuel. When a dead limb decomposes on the forest floor, it releases carbon dioxide — exactly what it releases when burnt in an efficient wood heater or steam engine. As Bob Rich said in his article 'Is firewood a green fuel?' (EG 72), "... smoke consists of bits of partially burnt wood and fine ash and is therefore biodegradable".

With such a low fuel consumption to provide so many power needs, the steam engine could be used anywhere there's a plentiful firewood supply.

Technical characteristics

The 4 to 5 hp model — the Liberty — is a horizontal mill type engine, with a three inch bore and four inch stroke. The engine is of the traditional horizontal double acting type, made from high quality grade 12 iron castings, with a fabricated crankshaft running in main bearings of contact sealed ball races. The big end bearing can be a split bronze bush running on a hardchromed crankpin or a greaseable needle roller race.

The valve gear is of the standard 'D' configuration, operated by an aluminium rod attached to a cast iron strap, and driven by a steel eccentric keyed to the crankshaft. They are manufactured as a non-reversing engine, but should it be required for a winding application, it can be fitted with slip eccentrics for multi-directional operation.

The engines are supplied fitted with cylinder drain cocks, carbon teflon gland packings and oil cup lubricators. The steam engines need no top end lubrication, so there can be no oil contamination. You can even run the engine on distilled water to gain maximum protection of the engine parts.

Strath Steam offers a choice of boilers for this engine. The simplest and cheapest type of wood-fired boilers are the vertical fire tube or multi-tubular under-fired horizontal type, both of which can be supplied by Strath Steam.

Waste product

One of the loveliest aspects of the Strath Steam engines is the waste product — boiling water!

At the ConFest, food stall holders were able to use the boiling water from the exhaust, which fed into a 44 gallon drum with a tap. The drum was covered with a piece of old carpet to act as a silencer, and obviously, in a permanent set-up, a more efficient system could be arranged.

Operation

It is easy to see the operating parts and understand the technology of the steam engine. Many people, who go glassy-eyed when confronted with the average motor, would no doubt enjoy learning the characteristics and habits of a Strath Steam engine.

"The technology's all visible. You can see the con rod going up and down. It's nowhere near as complex as a diesel box," says Rod Muller.

Rod believes there are two key advantages to the steam engines, which other independent system can't offer as easily.

Demand

"It's there when you want it. It doesn't suffer from the constraints inherent in wind and solar energy," he says. Regardless of the weather conditions your energy supply is assured.

Cheap energy

If you use your own supply of firewood, or fallen limbs and smaller dead trees in a woodlot or forest, it's free energy. An average household, using diesel, can easily spend $600 or more each year on power.

If you look at a lifespan of 50 years for a steam engine, it's not hard to work out that you could easily go through at least six diesel generators in that time. But 50 years might be conservative: anyone who has been to India knows how old machinery can last 100 years or longer if properly maintained. A steam engine could become like an old Aga wood stove — a fond memory of many people's childhood, and still going strong.

The boiler must be registered and Rod recommends that people interested in buying a steam engine do a short TAFE course which leads to a Boiler Attendant's Ticket.

"If anyone does such a course, they'll probably end up knowing more than they'll ever need to," says Rod.

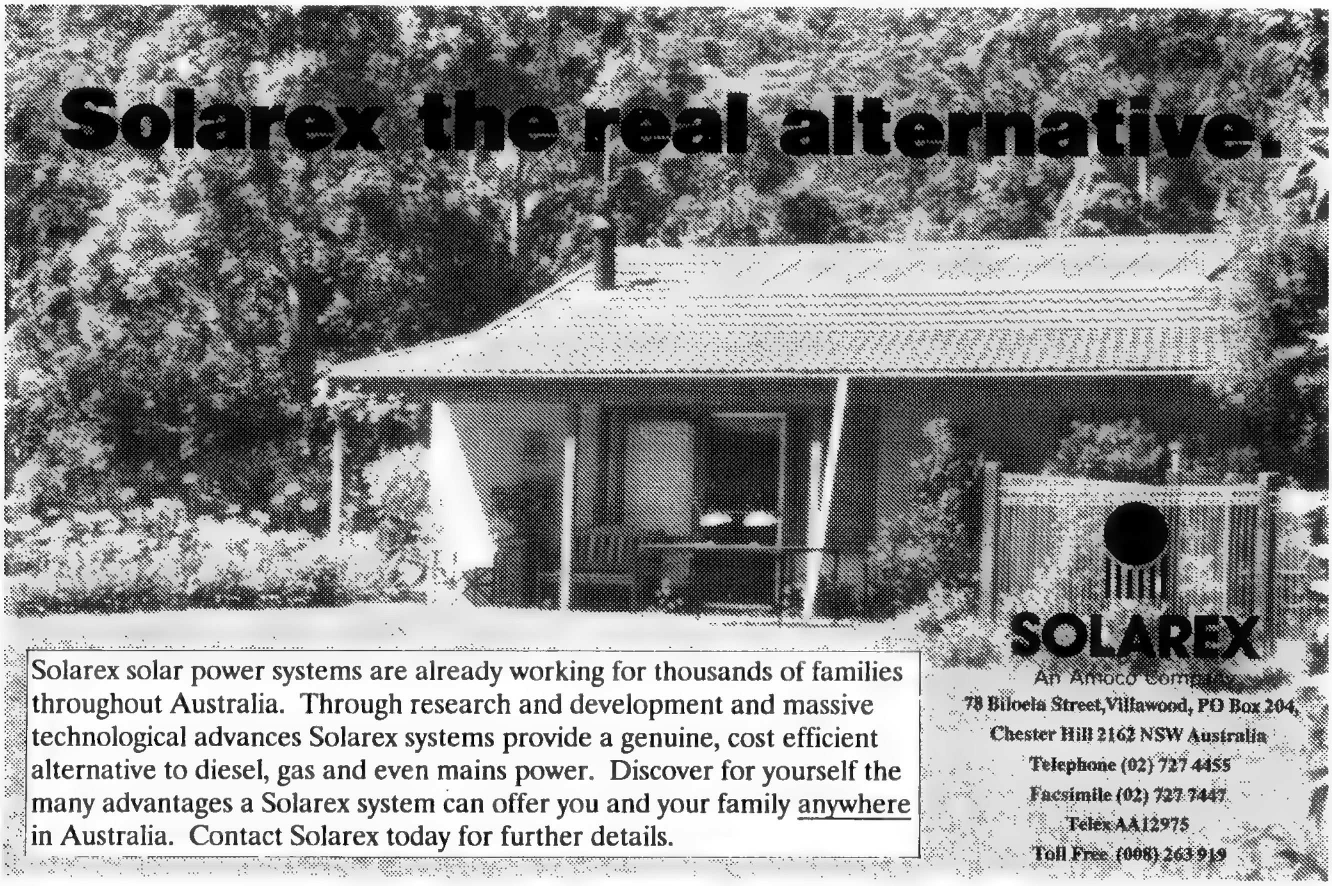
Development

Rod's idea to manufacture the steam engines grew from the metal pattern-making business he runs with his wife. Trak Pul Engineering manufactures tooling for foundries and other metal industries.

After three years of market research and refining prototype engines, the first 5 hp model was released in January 1990. Rod now has four models available, with two designed to be marine engines, and the other two being the 4 to 5 hp 'Liberty', and a 10 hp version.

Cost

The price of the Liberty 4 to 5 hp engine is approximately $2,500. The price of the 8 to 10 hp 'Independence' is approximately $4,000. A vertical boiler, like the type Rod



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used at the ConFest, costs approximately $3,100 and the horizontal boiler costs approximately $3,600. These prices are for the units, ex-factory, with no tax added because they would be considered home lighting plants. Generators can vary in price, but a car alternator might cost between $100 and $200, while a 240 volt alternator would be approximately $700.

Future

Rod's commitment to alternative energy and protecting the Earth's resources is obvious — he uses solar lighting in his own home and drives a three-wheeled electric buggy charged by solar power.

An exciting prospect for the Strath Steam engines is that they are perfectly suited to developing nations. For instance, many Pacific Island communities rely on expensive, high-maintenance diesel generators. They could convert to steam, save huge amounts on maintenance, and have a free renewable fuel source — coconut shells. In Papua New Guinea, a rice mill could power a steam engine with its own rice husks.

Rod believes the next two years are a critical time in establishing steam engines around Australia so that overseas markets can be examined.

"I'm sure there will be a big return to the use of steam power, especially as more and more people are realising the need to conserve the Earth's non-renewable resources," he says.

Preserving tomatoes

by Jackie French
Araluen Valley, New South Wales.

UNTIL the nineteenth Century tomatoes were still regarded with suspicion by all but the upper classes. They were believed to be poisonous, aphrodisiacs, and at best luxuries to be savoured by themselves. Within 20 years they had become staples with recipes being devised for keeping the harvest till the next summer.

Preserved uncooked tomatoes

Take ripe, firm small tomatoes. They must have no bruise or blemish at all. Make sure they are clean and quite dry. Place them in a tall, deep jar, one at a time.

Again, make sure they do not squash, bruise or split. Cover them with oil right to the top of the jar. Seal the jar. Keep it in the fridge till needed. These will keep up to six months or even longer.

Tomato paste

There are dozens of ways of making tomato paste. Try chopping the tomatoes, add no water and simmer till they are thick and bubbling like magma — great bursts of bubbles that spread over the kitchen. Spread the mixture on alfoil and leave it in the sun till dry, and take it indoors in wet weather or at night. Now roll the sticky mixture into balls, dip each ball in a cup of oil and store in sealed glass jars in the fridge. Take out a ball as you need it. Otherwise just stuff the paste in a jar and cover the lot with oil (although this method may give an uneven surface as you use it which may not be oil covered, so you can lose some of the paste to fungus).

If you don't want to dry the paste in the sun boil it down as far as possible with a tablespoon of white vinegar or half a teaspoon of citric acid for every four cups of tomatoes. Pack the thick puree into glass jars, and cover with a film of oil. Place the jars in the oven in a tray of water and cook till the water just boils. Leave till cool and seal.

The paste can be flavoured at the simmering stage with garlic, black pepper or very finely chopped basil or thyme.

Sweet preserved tomatoes

Take some tomatoes, sugar, basil and garlic. Skin the tomatoes by pouring boiling water over them. Place them in a dish and cover with sugar. Leave them for two days, then pour off the syrup. Boil the syrup for five minutes, then skim off the scum. Pour the cold syrup over the tomatoes then leave them for another two days. Boil the syrup again. Leave another two days and repeat.

Take out the tomatoes carefully and put them in the sun on wire racks. Take them in at night and put them out again when you are sure no moisture will touch them. They should be crisp on the outside and quite ready in a week of hot sun or two weeks of mild weather.

Place them in a wooden box (not plastic — they sweat) with castor sugar packed between them so none are touching. Put a lid on the box.

These tomatoes should keep for three years.

Sun dried tomatoes

These are wonderful. Cut you tomatoes in half. Leave them on trays in the sun for three days to a week till dry — they should be chewy rather than crisp. Pack them in jars with a little garlic, basil or fresh thyme. Pack them down hard then fill the jars with olive oil. Put the tops on the jars and keep them till needed. Add the tomato and oil to soups and stews.

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Annual organic gathering continues to flourish

THE Grow Organic '91 Seminar in Victoria's East Gippsland attracted over 250 people during the three days of the 26 to 28 January long weekend. The East Gippsland Organic Agriculture Association (EGOAA) held its annual seminar at the Ontos Health Retreat Centre (see story following) and the venue proved to be a valuable enhancement to the program of speakers and practical demonstrations.

For instance, Allen Gilbert, a popular Organic Consultant with the Department of Agriculture and Rural Affairs and author of numerous articles on no-dig gardening and pruning, was able to demonstrate techniques such as summer pruning of fruit trees — an approach which has many advantages when establishing young trees.

Although Allen had a set of colourful and explicit slides to illustrate his talks on the subject, the extensive Ontos fruit orchards provided instant 'raw material' to demonstrate his pruning techniques.

Jackie French was a big hit at Grow Organic '91. She gave three talks involving many subjects ranging from 'Why mosquitoes prefer blondes', to 'Pikelets as pesticides' and 'The sex life of the codlin moth'.

Numerous participants mentioned how informative they found Jackie and other speakers and many people were obviously itching to get home to their crops and gardens to put new advice into practice.

Krishna Yogi, the proprietor of Ontos, was also on hand to answer questions about the establishment of Ontos and the way the crops, fruit and vegetable plots and goat herds have developed.

Krishna led tours of the farm during which people were able to inspect the Angora goats' shearing sheds, as well as get an overall picture of how the roads, dams, crops, livestock, and fruit and vegetable activities tie into an overall strategy for developing the 600 acre farm.

EGOAA is obviously in healthy shape and its hard-working committee members such as Bill Hankin, and Robyn and Bill Grant, can be proud of such a successful annual event, which attracted participants from far-flung regions of Victoria and interstate.

Concentrating on Allen Gilbert's advice about summer pruning in the Ontos fruit orchard.

Community life at Ontos

The ONTOS health retreat, which hosted the recent 'Grow Organic '91 Seminar' evolved from the Sunrise Farm project. Thirteen years ago an article about the community, near Buchan in Victoria's East Gippsland, appeared in Earth Garden 24. Here we present an update describing the developments and changes since 1978.

by Neal Hoptman

ONTOS, East Gippsland, Victoria.

IN 1978, when Earth Garden featured a story about our community venture, the ONTOS property plus an adjoining 600 acres were referred to as Sunrise Farm. Sunrise Farm continues to flourish next door and the ONTOS Health Retreat, which comprises 700 acres, has also continued to evolve.

There have been a lot of changes in the role and function of ONTOS during the past 13 years. Initially ONTOS was developed with two goals in mind. Firstly, to develop a spiritual residential community, with a village structure, to work on the land; and secondly, to provide an ashram setting for short-term guests to learn yoga, improve their health, and participate in gardening, farming and building, while enjoying the beauty of the Snowy River Wilderness which surrounds the property. Integral yoga was the foundation with its focus on developing an easeful body, peaceful mind and a useful life.

During the 1980s several thousands of people passed through the gates of ONTOS as either residents or guests and the idealism of its founders was tempered with the realities of community life, spiritual pursuits, and a transient population. Many people experimented with the lifestyle for a time as residents, until a number of factors forced them to leave. These included:

- •the isolation of the property from employment
- •lack of educational and cultural opportunities
- •differences in approach and philosophy regarding community
- •the legal structure of ONTOS
- •and the hard work of life on the land.

ONTOS was always a haven during these years where people could come to live, particularly during times of transition in their lives. I had left my profession and the hectic lifestyle of the city and at ONTOS was able with my partner to develop a vegetarian and yogic lifestyle amid some of the most beautiful countryside in the world. We worked in exchange for our room and board and contributed not only our physical labour but also our ideas and feelings about community life and our role at ONTOS. This was a special time of pioneering and opened our eyes to the complexity of the tasks we had taken on. Many people still keep in contact through letters or visits and let us know how their time at ONTOS changed their lives.

The word ONTOS comes from the Greek language and translates as 'being'. The property has always been a place where people could experiment with spiritual growth in a natural setting, and enjoy the state of just 'being' in harmony with themselves and Nature.

Over the years a large retreat centre has been built by residents and now includes 16 modern motel style units, six timber cabins, a large dining hall and lounge complex with kids' activities rooms, an All Faiths temple for meditation, hatha yoga and spiritual attunement, a healing arts centre, a conference centre, camping area, adventure playground, library, craft shop and office.

Organic farming and gardening

On the organic farming and gardening side, ONTOS

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A view of Ontos from the shearing shed — 600 acres of stress-relieving countryside.

has been certified as Level A organic by NASAA. Extensive vegetable garden areas have been developed plus two full hothouses and fruit and nut orchards. We now have over 500 Angora goats and extensive broad scale agricultural areas which this year are producing organic wheat.

The property has a well established infrastructure with numerous dams, irrigation systems and fresh water storage, three houses, and an excellent road system. However, one aspect that has not developed as planned is the growth of a committed group of community members who stay on through hard times.

Like many communities throughout the world, ONTOS residents were not able to take the good times and ideals, with the difficult times and the compromises. About four years ago, ONTOS began to shift its focus away from the ashram setting to its current role as a health retreat centre where guests can come for short periods to experience activities including organic gardening and farming, hatha yoga, massage, bushwalking tracks, meditation, farm tours, health workshops, kids' programs, relaxation classes, or just a bush holiday in a healthy family atmosphere. A new role for ONTOS is to host groups and conferences such as Grow Organic '91, for those interested in a natural, healthy venue with extensive support facilities.

ONTOS continues to develop and improve its orchards and vegetable growing areas to try and provide as much food as it can for its residents and guests, with the surplus being sold in Bairnsdale. At present there are four adults and five children living permanently on the property. While there is room for more residents the demands of this lifestyle are as strong as ever and most people just visit under the Willing Workers on Organic Farms (WWOOF) scheme, exchanging labour for room and board and an opportunity to learn.

We are now receiving record numbers of visitors to ONTOS for healthy holidays and conferences, but the spiritual commitment of service is still the number one goal of the ONTOS residents, whether it be assisting people in the areas of organic gardening and agriculture, yoga postures and meditation, a healthy vegetarian diet, or just allowing them to relax in a comfortable bush setting. ONTOS is still a wonderful place to 'be'.

•For further information on any aspect of ONTOS, call (051) 550275 or write to ONTOS Health Retreat, Buchan Post Office, Victoria, 3885.

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The quandong — Australia's great new tree crop

by Geoff Wilson*

Caulfield South, Victoria.

AUSTRALIA'S quandong, or native peach, could become an important income-earning tree crop for Australia by the year 2000. I predict this because of the known investment interest in the tree, and the likely investment interest by farmers and other rural investors once they know more about it. The quandong has long been regarded as having potential for farming in Australia.

However, it is only recently that the CSIRO and others have developed enough knowledge to make quandong farming a practical and economic proposition.

Also, Australia's developing tourist industry has only just begun to realise what a unique food we have in the quandong — both for use in local restaurants and hotels as a uniquely Australian dessert and as a low-weight dried food that can be sold as a souvenir to departing visitors.

Dried quandong flesh is selling for around $50 a kilogram — with each kilogram providing about 100 to 150 serves.

The quandong (pronounced kwon-dong) is a tree native to large arid and semi-arid areas of Australia. It is a member of the sandalwood family (Santalum species), and produces a fruit in late spring and early summer. This harvest time fits in well with the farm labour year, or work for travelling fruitpickers.

Quandong fruit has been widely used by Australian Aborigines. It is called 'the native peach' for its flavour when lightly stewed. But the fruit is bitter until cooked, when it takes on flavours like peaches, plums or cherries. The best flavoured fruits are ruby red, and are best cooked after the flesh or husk of the quandong is removed from its large, dimpled nut, and dried.

These dimpled nuts were well known to many people 20 to 30 years ago because of their use as counters in 'Chinese Checkers'. The kernel inside the nuts is currently being studied for its bacteriocidal properties. This study springs from the use Aborigines made of quandong kernel paste to protect wounds and to encourage healing.

There is great variety in quandong fruit colour (from red to yellow) and flavour which makes quandong variety selection an interesting prospect for horticulturalists.

Dried quandong flesh can be stored indefinitely, and is easily sterilised with heat, and later reconstituted by soaking in water. It is then stewed lightly and sugared to taste for dessert use with cream, ice cream or yogurt. The stewed fruit can be frozen, and again, it has an indefinite shelf life.

This makes quandong an ideal dessert flavouring for both restaurant use and commercial flavouring as well as domestic cooking. A jar of dried quandong can become a handy standby dessert for any kitchen.

It makes the quandong of special interest to the dairy food industry seeking a unique new flavour for desserts, especially ice cream, yogurts and custards.

I forecast a big new investment in quandong farming as a result of these factors alone.

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*Geoff Wilson is Executive Director of the International Tree Crops Institute, a non-government organisation that operates in five countries of the Asia-Pacific region. He has been an agricultural journalist for 34 years and a tree crop specialist for nearly 20 years. The Institute promotes agroforestry and other farm tree systems which improve farm productivity and overcome land degradation.

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Farming future

Other factors will be equally important in farmer interest. Quandongs can be grown on relatively poor soils in poor rainfalls. The rainfall range of the quandong is from 300 to 900 mm. Most of the best quandongs are now found in Australia's arid zone.

Quandongs can be grown using salty water. Quandong farmer, Brian Powell, at Quorn, South Australia, has been drip irrigating an orchard of 300 or so quandong trees with bore water containing around 3,000 parts per million of salt, for 10 years. He believes quandongs will stand up to 8,000 ppm of salt.

Australia has great resources of poor land and salty water! Probably the most economic quandong growing will occur in arid zone areas where natural stands can be fenced from livestock such as cattle and sheep, native grazing animals such as the kangaroo, and vermin such as the rabbit.

The quandong foliage is most palatable, which raises the prospect of quandong cultivars for dry-country fodder as well as valuable fruit for sale.

But I envisage the development of quandong orchards in Australia both in useful sidelines around many farm homesteads in Australia's dry country, and in large, corporate plantations.

The best quandong trees are now producing up to three kg of dried fruit a year, and work is in progress to both tissue culture and graft the best trees. Growing from seed alone gives trees that vary enormously in tree size, fruit volume per tree, and fruit flavour.

The natural habitat of quandongs covers an estimated 300 million hectares or so the the Australian continent. It does best in the large tracts of sandy or gravelly country of the inland.

Unfortunately, much of the quandong gene pool has been lost due to overgrazing of cattle and sheep, and rabbits (plus pressure on the tree from native animals seeking fodder during drought). Brian Powell reports that the best-flavoured quandongs are in the arid zone, especially the Simpson Desert.

Their development is awaiting an expected breakthrough in grafting technique.

It is believed that the quandong is a dry-country tree crop that should be well suited to cultivation in California, Arizona, Mexico, and other parts of the world with a similar climate to Australia.

ITCI quandong promotion

The international Tree Crops Institute in Australia organised seminars on quandong farming in Mildura on February 19 and 20 and a lecture on quandong's farming potential in Melbourne on February 22.

However, the institute will also be interested in

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spreading the culture of quandong to countries with arid zones where improved food production for hungry people is an imperative. Australia cannot, in all good conscience, deny a hungry world of degraded land and salty waters the food benefits of its unique quandong tree. But Australians can take full advantage of their unique gene pool and become world leaders in quandong culture.

Macadamia lesson

Unfortunately this did not happen with the Australia's famed macadamia nut. Leadership in macadamia nut development and production was captured by far-sighted Americans in Hawaii, much to the disappointment of Australian pioneers in the field — who are still using Hawaiian cultivars of macadamia, rather than those developed for Australian conditions.

The leadership of the CSIRO, growers like Brian Powell, and promotion by ITCI, should help ensure that quandong leadership and development stays in Australia. But it will require enlightened support by government, and some courageous investment by rural landowners.

Such investment has begun. A 2,000 tree quandong orchard is already under way on Mallee sands in Victoria's north-west. It must be seen as the start of a new industry for our dry country.

Further information

Mr Geoff Wilson, International Tree Crops Institute, Melbourne. Phone (03) 571 6209. Fax (03) 571 8502.

Geoff is co-authoring a book *Farming Australia's Quandongs* with Brian Powell of Quorn, South Australia, noted quandong farmer.

Mr Powell has been operating a 300-tree quandong orchard initiated by CSIRO's Division of Horticultural Research, for 10 years. He is a former sheep station manager who has become a recognised expert in dry-country native trees and shrubs.

Australia's 'native peach' — the quandong.

He has also considerable experience in using salty bore water to drip-irrigate native trees on poor soils. Mr Powell has pioneered the growing of quandongs commercially, and their marketing to tourist-oriented establishments.

Growing quandongs

— The quandong (Santalum acuminatum) —

THE quandong's habitat extends across the arid and semi-arid regions of the southwestern part of the continent. It has become less noticeable in recent years due to the depredations of land clearance, grazing, rabbits and goats, but it can still be seen growing wild in the South Australian mid-north, the Murray Mallee and as far north as Alice Springs.

Many people who grew up in country towns remember eating quandong pies, jams and jellies and playing games with the round stones. Aborigines traditionally included both the flesh and the kernel in their diet and were thought to dry and store the flesh for later consumption.

The CSIRO Division of Horticulture first became involved in research to domesticate the quandong about 20 years ago. The domestication of a wild, undeveloped tree fruit species is a rare and very long term project. Apples, apricots and peaches have been under development for hundreds, even thousands of years to appear as the fruit we recognise today. The CSIRO is using modern selection and propagation techniques to speed up the process for the Australian quandong.

Quandong seed was collected from a number of sites across Australia to establish the CSIRO's experimental plantations. Seedlings were found to be highly variable for characteristics such as yield, fruit size, sugar content, leaf shape and tree form. Work has concentrated on devising improved methods of seed germination, vegetative propagation and grafting, developing orchard management techniques and measuring yields, fruit size, shape, colour and nutritional content.

The aim of the project is to produce high yielding cultivars which bear reliably, are drought and salt tolerant and resistant to pests and diseases. The fruit should be large and have good flavour, and be free of bitterness.

Methods have been developed for grafting plants with these characteristics onto seedling rootstocks. This will shorten the time to bearing fruit of five to seven years for seedling trees down to about three years.

Growing quandongs

Quandong trees can be grown from seed or purchased as seedlings from some nurseries. The trees are not widely available, and are protected in the wild. If you wish to collect seed in the bush, check with your local State environment office first.

The seed can be difficult to germinate and fungal infection is a serious problem. Hygienic handling procedures are essential. The following method has met with reasonable success:

•Without removing the shell, sterilise the seed by soaking it in dilute household bleach solution for 30 minutes (100 ml bleach, 900 ml water, 10 drops of detergent). Rinse with clean water.

•Place a number of seeds in a plastic bag with moist wood shavings. Store them in the dark at 16 to 20° C. Examine the bags every couple of weeks. Any germinating seed with a root of at least four to five cm can be carefully transferred to a pot containing a moist, light, free-draining, sterilised potting mix.

Germination takes place at about 16 to 20° C. Because quandongs are partial root parasites a suitable host plant should be provided once the seedlings have reached five or six cm in height. Lucerne, clover, kikuyu as well as a number of Australian native plants such as *Kennedia prostrata* appear to act as suitable hosts. A host plant which will not outgrow the slow growing quandong is preferred. The seedlings should be fed with a natural fertiliser that includes iron.

Seedlings grown in pots can be planted in the field when they are 15 to 30 cm tall. The best time to plant is either spring or autumn when there is sufficient water, and mild temperatures for establishment. Once planted into the ground it is essential to keep the young plants moist. Although the trees grow naturally in quite arid conditions, they seem to do well with at least some irrigation in the drier areas.

The planting area should be well-drained and for home gardens a raised bed is helpful. It is advisable to harden off the plants before planting them. Transplant the quandong along with its host, and be careful not to disturb the roots. Regular watering is important during the first summer. The plants must be protected against snails and rabbits, and frequent mowing or pruning of the host plant may be necessary to prevent crowding of the slow growing quandong.

The bark of young quandong trees is soft and care must be taken when tying them to stakes. Fertilise the trees in spring and autumn with a teaspoon of blood and bone plus a little iron. The dose should be increased in proportion with tree growth. After the first summer the trees require little water but will benefit if it is supplied.

Nutritional value

Quandong fruits have been analysed for their sugar and vitamin content. The major sugars present are fructose and glucose with a total sugar content between 7 and 12 percent, which is low in comparison to most domestic fruit varieties. Fruits of most genotypes have vitamin C contents between 50 and 80 milligrams per gram of fresh fruit, which is slightly higher than the average content in oranges.

Eating quandongs

Fresh quandongs can be used immediately, but because of their dry texture and low sugar content they lack appeal as a fresh fruit. They are at their best stewed or made into pies, jams, jellies or sauces with sugar added to taste. They can be cooked on their own or blended with other fruits such as sultanas, dates or apples. They can be packed in a jar of brandy, with sugar to taste, to make brandied quandongs and a pleasant liqueur. They can be sun dried or freeze dried for use out of season without appreciable loss of flavour or nutritional value.

The people of the bush who know the quandong appreciate it. The flavour is not pronounced and the fruits are low in sugar. However, they do contain high levels of refreshing acidity and in this respect are similar to sour cherries. The question is, can varieties be developed for the pampered palate of the populace at large?

If the experience of Beerenberg, the South Australian company which makes home-made style jams, is any indication, then the quandong has a bright future. They are marketing small quantities of quandong jam and cannot keep up with the demand.

Enquiries

Ms A Cooper (Information Officer), CSIRO Division of Quandong Research, Hartley Grove, Urrbrae, South Australia, GPO Box 350, Adelaide, South Australia, 5001. Telephone: (08) 274 9244, or fax: (08) 274 9247.

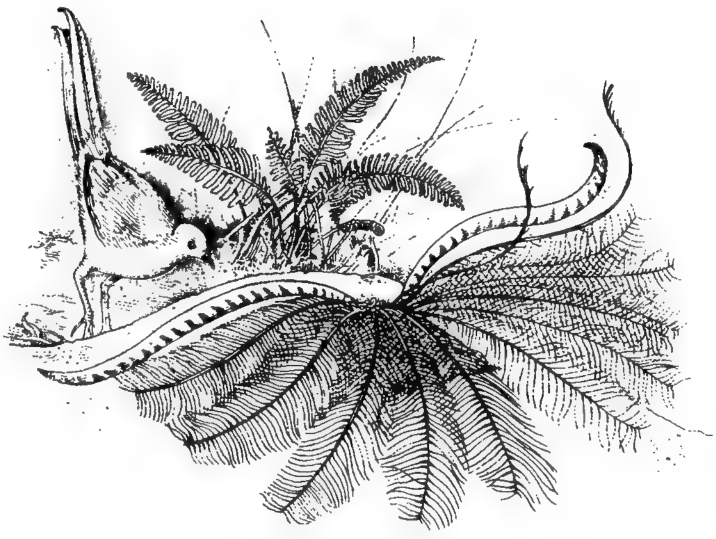
Sunraysia Nurseries, Box 45, Gol Gol, NSW, 2738, is the CSIRO's approved supplier of wholesale, commercial quandong material.

Mark of the covenant

The Victorian Conservation Trust has recently released a booklet on covenanting. The booklet describes how to protect private land with conservation values for future generations. By March 1990 104 conservation covenants had been approved in Victoria, thereby protecting 4,200 hectares.

In South Australia they are known as 'heritage agreements' and protect 200,000 hectares of private land. In New South Wales they are 'conservation agreements' and in New Zealand the Queen Elizabeth II National Trust calls them 'open-space covenants'. In the USA, 50 States have statutory covenants (easements), and they are the fastest growing segment of the conservation movement.

A CONSERVATION covenant is an agreement between a landowner and the Conservation Trust which seeks to protect and enhance the natural, cultural and scientific values of privately owned land. Once the terms of the covenant are approved by the Minister for Conservation and Environment the covenant is registered on the certificate of title and binds all future owners. Most covenants are designed to be permanent although they can be specified for a particular time.



Ownership and control of the property remains with the owner. If the land is mortgaged the mortgagee's consent must be obtained but this is usually straightforward. Conservation covenants have the force of law from the Victorian Conservation Trust Act.

Why do we need conservation covenants?

Since European settlement, 75 percent of Australia's rainforests have been cleared or burnt and two-thirds of our original tree cover removed. Of Australia's plant and animal species, 18 mammals are now extinct and a further 40 are endangered; 68 native animals and 28 birds are also threatened and 100 flowering plants are now extinct with a further 2,000 endangered. From 1972 to 1987, an average of 15,392 hectares of native forest were cleared annually in Victoria and 84 percent of this was on privately owned land.

Weed and vermin infestation, more clearances, changed fire regimes and genetic isolation have all led to greater pressures on our native plants and wildlife. Many species are now being destroyed at 1,000 times the natural rate. Animals and plants which were widespread before European settlement are now rare and are found only on private land.

Real protection?

Conservation covenants have the force of an Act of Parliament. Trust representatives can inspect properties and if the Trust learns of transgressions it will require owners to make good their actions. If necessary, the Trust would take legal action against a delinquent owner, seeking an injunction or damages for restoration.

How is an area assessed?

Owners who believe their land has conservation value and wish to see it protected permanently can apply for a covenant. The Trust considers the following factors when assessing areas:

- degree of disturbance due to agriculture or forestry
- number and diversity of native plants and wildlife
- presence of rare or endangered plants and animals
- value as a wildlife corridor, buffer to other reserves
- size of an area
- presence of weeds and pests
- long term viability and management implications.

•For further information, contact —

Victoria: (Covenants) Victorian Conservation Trust, 8th floor, 49 Spring St, Melbourne, Victoria, 3000.

South Australia: (Heritage Agreements) Native Vegetation Branch, Department of Environment and Planning, GPO Box 667, Adelaide, 5001. Phone (08) 216 7777. Contact Geoffrey Bishop.

New South Wales: National Parks and Wildlife Foundation of NSW, GPO Box 2666, Sydney, 2001. Telephone (02) 27 7971. Contact — Steve Sainsbury.

Season by Season

Earth Garden's regular organic gardening column, written by Jackie French

Free fruit, keeping the harvest, hand soothers, wood polish, moth repellents and more . . .

IT WAS afternoon tea, and we were the youngest there. They were reminiscing about the days of plenty, 'buckets full each year'. Walnuts that you ate as fast as they were cracked, chestnuts by the sackful, cherries that went through a seeder so you crammed them in by the handful, grapes by the basketful. Yet this was a time when money was short: shirts made from old flour sacks, patchwork skirts from 'need-not fashion'.

The writer Norman Douglas once said: "To be miserly towards your friends is not pretty; to be miserly towards yourself is contemptible." Yet this is what we have today: an apple at lunch time, floury and waxed, costing the best part of a dollar; peaches you buy individually because they cost so much, a kilogram of grapes. In the middle of peach season I know families who get more videos than peaches — peaches are 'too expensive'. But peaches cost nothing — if you grow them yourself.

At the moment we have boxes of peaches at the front door we're trying to give away. There are apricots that were fed to next door's goat, kiwifruit and apples that'll return to the compost (to grow more kiwifruit next year), and oranges waiting till someone has time to pick them. The trees get fed every few years, but apart from that they're a free food.

Free fruit trees

Every time you eat a piece of fruit — with the odd exception like most strawberries and bananas — you have enough genetic material to grow more fruit. Just plant the seed.

Many seedlings trees don't breed true to type, either because their parents were hybrids or because two varieties crossed naturally. This matters to commercial growers. They need all their fruit to look the same for marketing, and to fruit in the same way for spraying and picking. But this needn't concern the home grower. Most seedlings are like their parents — in many cases indistinguishable. In fact it's the ones that vary from their parents that I prize most because they are better adapted here, and they provide slightly different fruit from any I can buy.

It is easy to grow fruit from seed. Grow lots and throw out any that don't flourish. If after several years you find you don't like the fruit they produce, graft or bud a named variety (or several varieties) onto them. Or just plant them close together and after five or six years thin out the ones you don't want.

Grafted trees

Most fruit grows from seed, but grafted plants bear faster in most cases. The difference in bearing time can be almost negligible, or up to ten years. For example, I planted a seedling and a grafted avocado a few years ago. The seedling bore first. I find seedling avocadoes bear well and quickly, although you hear of those which never bear at all, or not for ten years. A seedling loquat tree, on the other hand, still hasn't fruited after 12 years, but a grafted one nearby fruited at three years old.

Seedlings nearly always bear, and usually with good fruit, but you may need patience.

Growing fruit trees from seed

The seeds of most evergreen fruit trees, like citrus, can usually be planted straight away, or kept till needed once the pulp around them is removed. Deciduous trees can be more complicated. You can plant the seed straight from the fruit, but it may take a while to germinate. Most deciduous seed is available in summer or autumn, and it will probably (but not always) need winter chilling before it will germinate.

Otherwise take the dried seeds, dip them in hot water for ten seconds, take them out for half a minute, and dip them again. Now place them in moist pots in the fridge for about two months. After a month check them each day and plant them out as they germinate.

Don't keep seed from deciduous trees in a warm cupboard over winter and expect it to germinate in spring. It won't have been chilled—especially if your house is heated. Keep the seed in the fridge till spring, or outside where it gets cold.

If you want to try germinating fresh seed drop it in warm water straight from the fruit, soak it for two days, then place it in a pot in a plastic bag or under a glass jar on a warm window sill. It should germinate in two weeks. If it doesn't you'll have to wait till spring.

An orchard from the supermarket shelves

Specialist fruit sections of supermarkets are an excellent source of seed of rare varieties, and a cheap source of common seed. Our tamarilloes grew from the supermarket. So did our chokoes, one of our oranges, mandarins, apricots, plums, one of our apple trees — and a host of others. Look for banana passionfruit, ordinary passionfruit, tamarilloes, fresh lychees and unusual varieties of avocado. They may not grow quite true to type but will probably be close.

Apples won't grow true to type, but they will probably resemble their parents — especially as most orchards grow only one or two types. Choose only very ripe apples. If the seeds and core seem malformed don't bother with them: they may not have been pollinated.

Nashi or oriental pear grows from seed (not true to type but it will resemble it). Persimmon seeds won't be fertile unless they're cross pollinated. Home grown persimmons are less likely to be fertile than commercial ones.

Look for cherries, citrus (limes or blood oranges or pink fleshed grapefruit) and plums. Japanese plums are reasonably true to type but European plums vary. Some plants may not bear. Plant your apricot stones, pineapple tops, kiwifruit seeds, peach pips, almonds and all other nuts as long as they are fresh (and not roasted), as well as blueberries, feijoas and pepinos.

With few exceptions (like runner strawberries and modern bananas) most fruit contains seed, and this can be planted. As long as you realise you may not get an identical copy of the fruit the seed came from, seed from commercial fruit orchards usually produces worthwhile offspring.

Squeezing in more fruit trees

Plant closely

We plant our fruit trees about two metres apart. They grow tall and tangle together but this keeps the birds at bay, and means they fruit over a month instead of all ripening at once. Don't waste space on grass between trees: jungle them together.

Plant under trees

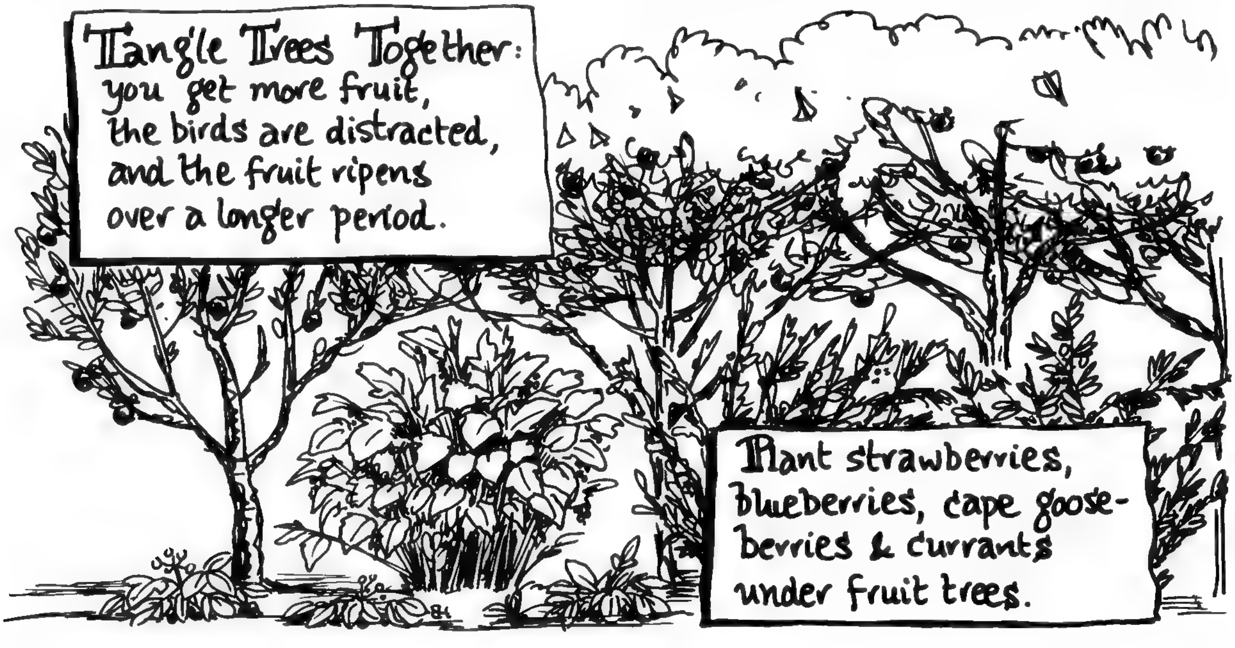
Many 'small fruits' such as strawberries, blueberries and cape gooseberries prefer semi-shade. Rhubarb grows tall and tender under fruit trees. So do celery and lettuce, although you have to feed them enough to compete with tree roots (a good mulch is all that's needed).

Terraces

Terraces make space. Our main kitchen garden is in a series of terraces just out the back door. It surrounds an area of paving which both stores and reflects heat, and keeps our winter plants growing long after less protected ones have succumbed to frost. If your ground rises, terrace it. If it doesn't, make a mound and terrace that.

Potted trees

If you don't have land, use pots, old rubbish bins or anything else you can get. Keep them on your porch, near windows indoors (take them outside occasionally), or even


Tangle Trees Together: you get more fruit, the birds are distracted, and the fruit ripens over a longer period.
Plant strawberries, blueberries, cape gooseberries & currants under fruit trees.

in the driveway. Potted trees are an excellent way of growing frost-sensitive fruit in cold areas. Don't just rely on the old pot standbys like cumquat, bay tree and Meyer lemon.

Try dwarf apples, dwarf nectarines, or dwarf peaches. Tamarilloes, mountain paw paws, cape gooseberries, gooseberries, 'hanging pots' of strawberries and lime trees can all grow well in pots.

Avocadoes can also do well but if you grow them inside you'll have to pollinate them yourself with a paint brush — there are no bees inside. You can also try persimmons, feijoas, guavas, passionfruit trained up a stake, grapes trained out the window, raspberries, blueberries and currants.

Keeping the autumn harvest

Capsicum or paprika

Dried ground capsicum are paprika or red pepper. The hotter the variety the hotter the pepper. Dry thin strips of capsicum in the sun or a cool oven till they snap instead of bending.

Grind it in the blender, pound it in a mortar or put it through a grinder. Paprika may need to be dried again after grinding, then stored in a sealed jar in a dry, dark place.

Preserved capsicum strips

Blanch the strips for ten seconds in boiling water, and then cover them with vinegar and a thick layer of olive oil. Garlic or basil leaves can also be added. Seal the jars and use them when needed.

Bottled capsicums

Choose ripe red capsicums. Halve them, take out the seeds, and lie them on the griller with the cut side down. When they blister, remove the skins. This step is essential and gives the capsicums a richer flavour. Make sure every scrap of skin is gone. This isn't as difficult as it sounds — the skins come off quite easily. However, they don't come off the thin, green shop-bought capsicums very easily. If the capsicums aren't fat and ripe don't try this recipe.

Chop the capsicum into very thin strips. Press them into small jars, and add a few leaves of basil (try thyme if you have no basil) or tarragon but not mixed herbs. Pour over enough olive oil to fill the jars. They shouldn't need much if you have squashed down the capsicums. Place the jars in a saucepan of water up to their shoulders. Bring it to the boil slowly in well salted water and boil for 20 minutes. Take it off the heat, make sure the lids are tight, and keep it in a cool cupboard.

These peppers can be used for cooking but are good simply as a salad with a little lemon juice squeezed over at the last minute, with salt if you like it, or a few olives. They make a wonderful topping for very fresh homemade pasta — just the capsicums and oil and nothing else.

Celery salt

Celery is naturally salty and can be used to season dishes. Slice the celery thinly and dry it in a cool oven or outdoors on alfoil (when the weather's dark or damp take the celery indoors) or of course in a home dryer. Blend or pound mortar the celery when it's dry enough to snap.

Dry the powder again in a cool oven or the midday sun for a couple of hours before storing it in sealed jars. Use it by the spoonful to season soups, stews, breads or potato chips.

Choko to taste like pears

Simmer three peeled, cored, quartered chokoes till they're tender in a syrup of three cups of sugar or honey to one cup of water, with the juice of a lemon and a vanilla bean (take this out as soon as the fruit is cooked). Bottle the choko in syrup, and seal it. Don't eat it for a month.

These don't really taste like pears, but the recipe does disguise the choko. This preserve is best mixed with other fruit in tarts or hot fruit salads.

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Parched corn

Leave some cobs on the stalk till they are dry, cut them off with a knife and then leave them in a sealed container in the fridge. They should keep for three months or more. Fry them in oil like pop corn. They won't pop properly and they'll be more chewy but I prefer them like that. To improve the flavour add a bit of garlic to the oil, and a touch of pepper afterwards.

Corn vinegar

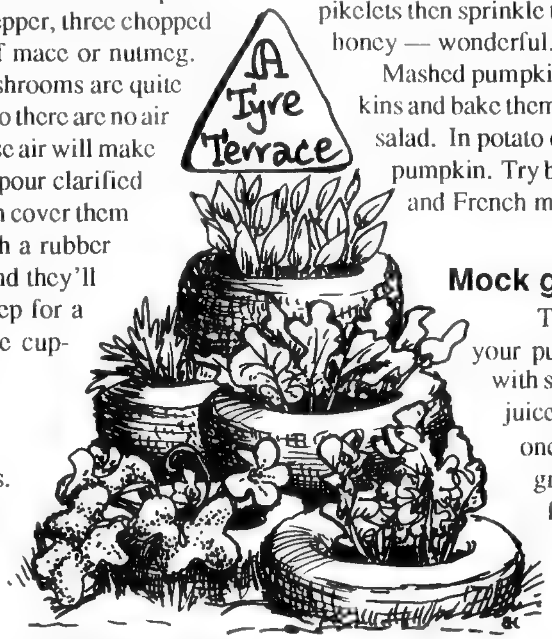
Take ripe corn and soak it overnight in 20 times its volume of water. Heat this gently till the corn starts to swell. Don't let it burst. Strain off the cooled liquid and add four cups of sugar or honey for every kilogram of corn. Leave the liquid in a bottle without a lid in the sun (say the window sill). It should become vinegar in about a month. Heat it to boiling, remove it from the heat, bottle and seal.

Hominy

Boil your corn or maize kernels till they are slushy. Corn needs less cooking than maize, and young maize needs less cooking than old maize. Add a teaspoon of salt to every three cups of slush (it should be dry enough so that no liquid runs out if the pan is tilted). Place it in a sealed jar in the fridge or cool cupboard. Hominy keeps for months. When you want to serve it, heat it up and add butter to taste, perhaps with cream and sugar. It can also be left cold, patted into thin cakes, and fried.

Preserved mushrooms

Take five cups of mushrooms with two tablespoons of butter, a good sprinkle of black pepper, three chopped garlic cloves and half a teaspoon of mace or nutmeg. Stew all this in the butter till the mushrooms are quite soft. Fill some small pots carefully, so there are no air gaps — this is most important because air will make them go bad). When they are cool, pour clarified butter or melted ghee over them, then cover them with greaseproof paper held on with a rubber band. Keep the pots in the fridge and they'll keep for weeks. They will also keep for a similar time in cool weather in the cupboard.



Tyres piled up in a pyramid with vegetables growing out of them. This is also good for wet areas......

Dried mushrooms

Don't wash the mushrooms. Just wipe them clean and remove the stems. String them on cotton with a darning needle and hang them on the washing line till the mushrooms are withered and quite dry. Take them in at night or in wet weather. Store them in screwed up paper in a glass jar with dried bay leaves or garlic cloves to keep away insects.

Mushrooms can also be chopped and dried in pieces in the sun on alfoil. Use them in soups, stews or the wok, but soak them before use. They may be too chewy to eat but they can be removed and should give a good flavour.

Bloody good pumpkin scones

1 tablespoon of honey
1 teaspoon of grated orange zest
2 tablespoons of butter
1 cup of mashed pumpkin — as orange and sweet as you can get it
1 well beaten egg
half a cup of milk
2 cups of self-raising flour.

Mix the orange zest with the flour. Work the butter and honey in with your fingers. Add the milk, egg and pumpkin but work as little as you can at this stage. Now cut it into thin rounds about as thick as the width of your thumb. Brush it with milk or beaten egg and bake it in a hot oven for 10 to 15 minutes.

These scones should be eaten fresh. If there are any left over toast them for breakfast (toasted breakfast scones were a feature of staying with my grandmother) or cut them into slices and bake them in the oven till crisp and crush for very superior 'breadcrumbs'.

Preserving excess pumpkin

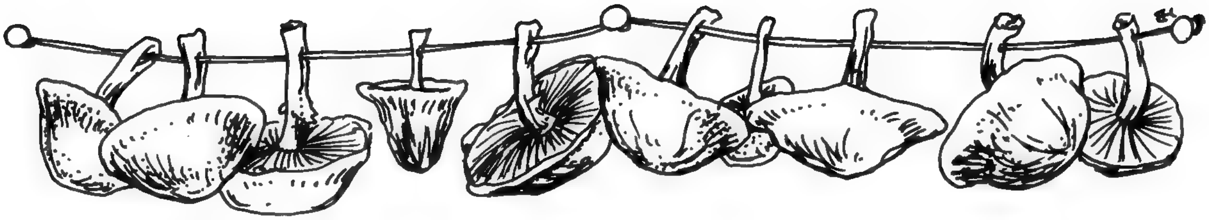
To make bread and cakes light and moist replace a third of the flour with mashed pumpkin. Do the same with pikelets then sprinkle them with sugar or spread them with honey — wonderful.

Mashed pumpkin can be frozen. Stuff whole pumpkins and bake them, or make pumpkin instead of potato salad. In potato or fish cakes replace the potato with pumpkin. Try baked pumpkin with a sauce of cream and French mustard boiled for three minutes.

Mock ginger

This is an old Colonial standby. Chop your pumpkin into neat slices, sprinkle it with salt and leave overnight. Pour off the juice. Add a syrup of two cups of sugar to one cup of water and a dessertspoon of grated or powdered ginger. Boil this for an hour, pour it over the pumpkin, and leave it till it's cold.

Pour off the syrup and repeat this at least six times. The pumpkin should look as though it's starting to candy and change colour with the repeated applications of boil-



ing syrup. Put the lot in the oven till the pumpkin is cooked. The outside will still be crunchy due to its crystallising but the inside will be soft. Place it in clean jars while it's still hot, with a shaving of lemon zest. Seal it. Don't use it for at least three months. This keeps for years.

Preserved tomatoes

I have kept these for three years. Take ripe, firm small tomatoes. They must have no bruise or blemish at all. Make sure they are clean and quite dry. Place them in a tall, deep jar, one at a time. Again, make sure they do no squash, bruise or split. Cover them with oil right to the top of the jar. Seal the jar and keep it in the fridge till needed. These will keep for up to six months or even longer.

Household recipes

Hand soother

Take a cup full of well washed chickweed or comfrey root. Simmer it in a cup of olive oil (or any other oil you have on hand) till it starts to soften. Cool and strain it. Add 50 g of beeswax. If you don't know a beekeeper you can often buy it at the supermarket for sealing jars. As a last resort melt a candle. Heat it till it all mixes, cool it, and use it every time you wash your hands.

If you want this cream to smell good too, add rose petals, orange flowers, boronia or jasmine flowers, as well as the comfrey or chickweed.

Moth-free clothes

Forget about mothballs. They don't work and they have been associated with blood disorders, especially in young children. Go out and collect anything scented in the garden instead — especially lavender, santolina, wormwood leaves, woodruff, mugwort, camphor mint and other mints. These are all good moth repellents. Add scented geranium leaves, lemon balm and anything else that smells good.

Dry the mixture on newspaper in the sun for a week and turn it every day. Now layer petals and leaves and sprinkle each layer with ground nutmeg, whole cloves and a dash of ground cinnamon, as well as brown sugar and orris root (ground Florentine iris root, available at health food shops) as a fixitive. Rock rose, cistus leaves or myrrh leaves can also be used as a fixitive. Add them to the petals at the drying stage and forget about the orris root. Put the lid on the jar for a month till the perfumes are fixed, then leave the jar open in cupboards, fill sachets, or leave by doors to repel mosquitoes.

Home made wood polish

This isn't just for appearance — it preserves the wood and helps stop it warping. Use olive oil for light wood and linseed oil for dark wood. For every cup of oil add a tablespoon of beeswax. Melt it, then let harden, and rub it in with a soft cloth.

Rose honey

"Cut the white Heels from Red Roses, take half a pound of them and put them in a stone Jar, and pour on them three pints of boiling Water. Stir well and let them stand 12 hours. Then press off the Liquor and when it has settled add to it five pounds of Honey. Boil it well, and when it is the consistency of a thick Syrup it is ready to put Away.

—from 'A Treatise of Cleanness in Meates', 1692, by Thomas Tryon.

Autumn pests

By and large don't worry about pests at the moment: winter will clean them up for you. As a last resort for any pest, try glue — flour and water paste — diluted till it sprays. Use this on anything that moves when you don't want it to. Glued pests don't go far and birds can still feast on them.

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Questions and Answers

If you're bugged by household pests, can't remember a herbal remedy, want to know if that backyard shrub is useful, or have a plant problem, send a stamped self addressed envelope to Jackie French at RMB Araluen Valley, NSW 2622.

— Roo poo, dunny waste, alternative flea controls, lawn grubs, maggots in compost, comfrey weed barriers —

Dear Jackie,

Kangaroos graze on my land and leave plenty of droppings. What is the value of 'kangaroo poo' for the compost? While it can be a tedious job collecting it, I also know it's truly organic! I am also interested in your comments about disposing of human waste.

Dora Bereny.

Kanga-poo

Dear Dora,

Basically, the more protein eaten the higher the nitrogen level in the droppings. This means that your browsing kangaroos probably don't leave fabulous fertiliser behind them, unless they've been grazing on someone's lucerne. Roo poo is roughly equivalent to sheep manure, but unlikely to have as many weed seeds, because roos are more selective. It's not as rich as hen manure, which combines the urine too.

Roo poo should make excellent compost, because it'll be high in organic matter. However, you'll have to use a lot if you want its nitrogen to help break down old corn stalks and other low nitrogen material. It'll probably be low in phosphorous too, but you can be fairly sure it will be free of hormones, vermicide and other residues found in domestic manures.

If you're out scavenging in the paddocks, remember that any bones and deceased animals can be added to the compost bin — they're high in both phosphorous and nitrogen. The bodies will break down in a week or two, and the bones will take longer, especially if they've baked in the sun.

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If you don't want bones in your garden, leave them baking in the oven whenever you have it on for a few days. They'll become porous and breakable. Even 'road kills' can be added to the compost. At least that way the bodies will be loved in death, not left to balloon on the side of the road, and you can remember them with gratitude whenever the flowers bloom.

Human faeces

The important thing with faeces is to make sure that flies can't get to it (in other words bury it deeply) and that no one is going to dig a garden there — or a wombat dig it up — for at least 20 years. Some organisms like polio, hydatids and various worm cysts can survive for at least 20 years (if not much longer) in the soil. This may mean you leave a legacy on 'untouchable' land to the next tenants of your garden. Many people are carriers of diseases. Flies can transfer disease from diseased faeces even if they don't have symptoms, or children pick up infection walking there in bare feet.

Burying faeces under trees is a good idea. No one is likely to dig there but it may disturb the tree roots if it's too close.

One method of using the nutrients in human waste is to fence off a plot of ground, and place notices on it: 'No entry, human waste disposal'. Bury you waste there, then plant comfrey over it. It doesn't matter if you dig the comfrey up to bury more waste. It will quickly spread over the hole.

Comfrey is deep rooted, and will make use of the deeply buried nutrients. You can then harvest the comfrey leaves to use as fertiliser. Comfrey leaves are higher in nutrients than the equivalent weight of manure. You can use comfrey and nothing else to feed your garden or orchard.

Lucerne can also be used instead of comfrey. I've seen lucerne roots go down 22 feet in a well. Both comfrey and lucerne can be cut several times a year.

If you do have a toilet pan, try to convince guests and family to use the toilet for bowel movements only. Fresh urine is excellent for trees and shrubs and sterile till it hits the ground (unless the donor has a urinary tract infection — but that is unlikely to spread from under the fruit trees). Stored urine has too much ammonia and will burn roots and possibly kill the plant. To paraphrase an old saying: "If it's brown, dig it down, if it flows, let it go".

Dear Jackie,

I would like to know if there is a natural spray for treating lawn grubs. After heavy rain recently we've found our lawn badly infested with large areas dead. Also, is there a way of keeping our two dogs free of fleas without all the chemical dips so commonly used.

Regards,

Mrs Diane Walker, Tieri, Central Queensland.

Lawn grubs

The lawn grubs are probably white curl grubs (so called because they curl up when they are resting). They're usually scarab or cockchafer beetle larvae, and mostly eat plant roots (like grass) and sometimes lower leaves or stems. The most likely culprit is the blackheaded pasture cockchafer.

You might also have corbies (moth larvae) although these are mostly a problem in autumn and winter when the grass isn't growing and the caterpillars are almost fully grown. If there are webbed tunnels you probably have corbies. In this case you could use Dipel — a bacterial killer of caterpillars. Dipel won't work for curl grubs.

The best long term control is adding organic matter to the soil, and so increasing your nematode and other soil life population. Many of these will parasitise or eat the larvae. Try sprinkling compost over the grass in spring and autumn when grass growth is fastest. Make sure all lawn clippings are returned to the soil.

Beetles and moths usually lay their eggs where grass is fairly thin so improving grass growth with a bit of blood and bone and extra watering will help. It may also be worthwhile adding other species to your lawn. The more different sorts of grass and clovers you have, the more resistant your lawn will be to any pressure, whether insect, flood or drought.

Commercial flea collars

One common ingredient of flea collars, bendiocarb, is mildly toxic. Make sure it doesn't touch your skin. Symptoms include body pains, tremors, excessive sweating, headaches and a general sense of nervousness and tension. Bendiocarb persists for several months and can poison pets, fish and birds as well as humans.

Diazinon may also be used in flea collars. Diazinon is toxic to birds, bees and fish and has caused birth defects in animal tests.

Other common ingredients include lindane which has been associated with the often fatal aplastic anaemia. Lindane is highly toxic. The commonly used maldison is one of the safest organophosphates, but it has been associated with possible miscarriages or birth deformities, and flu-like symptoms or depression. It will kill earthworms.

A thick border of dahlias around a garden bed...
...will keep out weeds.

Carbaryl is an ingredient in many flea collars and flea shampoos. It can be absorbed through the skin and is poisonous. It kills earthworms (don't wash your pet on the lawn) bees, fish and some shellfish.

Flea collars may contain dichlorvos. Dichlorvos may trigger asthma. It is an organophosphate and depresses cholinesterase levels in the body, affecting the nervous system. The dichlorvos evaporates from pest strips and may affect people around it or food in cupboards. It is carcinogenic even at exposures from flea collars and pest strips. It may trigger asthmatic attacks, skin problems, or convulsions. It is also associated with depression, weakness and flu-like symptoms which may be difficult to recognise. Dichlorvos kills birds bees and fish.

Alternatives

I use derris dust (from garden centres) as an organic flea powder. Even better, although not as convenient, is a pure pyrethrum spray (also available at garden centres) sprayed on the 'hot spots'. Both kill fleas. There are also some pyrethrum dog washes on the market, but these can be hard to find.

Feeding dogs garlic or sulphur is supposed to help prevent fleas (three cloves a day for an average dog or a third of a teaspoon of sulphur) but I don't know how effective this is. The garlic at least will help keep the dog healthy. I used to bury the whole unpeeled garlic cloves in the dog food.

Often changing a dog's diet will help flea control but all furred animals are susceptible to some fleas, so worry about this only if your dogs seem to be unusually flea prone.

If the dogs get flea-induced eczema, try fennel vinegar. This is very simple. Just squash fennel tops into a jar or bottle and pour on hot vinegar. I use cider vinegar but white wine vinegar will do. Seal it and leave it overnight — the longer the better in fact, because it will get more pungent as time goes on.

The vinegar will help sooth the itching and the fennel is a flea repellent. It won't kill fleas already on the animal. It will just help keep other fleas away. Try washing the dog in hot soapy water before you put it on, then dab it on the 'hot spots' — around the tail, under the arms and the neck. Apply it every day, or twice a day in bad cases. You might also like to try ti tree oil — it'll both soothe the itching and help repel fleas.

Dear Jackie,

I am writing to ask you if you know of a supply of comfrey in seed or seedling form. Who would have current stocks? I'm finding it very difficult to obtain at the moment. After reading your article in Earth Garden 74 about planting comfrey around borders to control weeds I immediately set about trying to purchase some, but to no avail.

If there's no chance of purchasing some comfrey, could you advise me please of another suitable way to control couch grass.

In anticipation, thank you,

Jenny Belfrage, Warrnambool.

Comfrey

Dear Jenny,

Comfrey doesn't grow from seeds, thank goodness, or it would be Australia's worst weed. You need parts of the plant root to get comfrey established in your garden. Any bit will grow into a plant, but the bigger the bit of root the bigger the first year's plant. Comfrey grows incredibly quickly, and almost any comfrey growers should give you some.

Most nurseries stock comfrey with their herbs. Try asking your local nursery to order you some— the more you order the cheaper it should be. You can also buy it from Eden Seeds (an excellent source of non-hybrid seeds) at MS 316, Gympie, Queensland, 4570. It's also available from Honeysuckle Cottage Nursery, Bowen Mt Rd, Bowen Mountain, New South Wales, 2753, or from New Gippsland Seed Farm, PO Box 1, Sylvan, Victoria, 3795. Better still, stick an advertisement in your local grocer's shop asking for root cuttings from someone nearby.

If you can't get hold of comfrey I also use dahlias, planted as close together as possible, at least two deep around the garden. They come up in spring here about the

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same time the grass starts spreading. You could also try radishes, parsnips or turnips three deep as a temporary measure.

A piece of metal, about half a metre deep, pushed into the soil, will also keep grass runners out.

Dear Ms French,

For over a year I have used a pit compost heap which has worked well and was full of large earthworms. Recently it has become infested with maggots—brownish, segmented and about two cm long. They continue to multiply, all earthworms have disappeared and the heap is developing a sour, putrid smell. No meat goes into the heap, so I do not know what attracts them.

Can you suggest a way of getting rid of them without harming the soil and compost all around.

Thank you for your help. Your faithfully,

Kim Downs, Stanmore, NSW.

Compost improvements

Dear Kim,

It sounds as though your pit compost has become anaerobic — composting without air. This gives it a smell like burning nylon stocks. It will still rot down — just in a smelly way.

Flies are attracted to not just meat but anything that's rotting, even piles of lawn clippings. A good compost heap though will be too hot for them. Add more nitrogen, such as your own urine, hen manure or blood and bone dissolved in water. Do this every three days till it starts to heat up. You may also like to toss it with a garden fork. This will add air, and make it 'aerobic' again, and hopefully diminish the smell.

As a last resort, after having added hen manure, cover it with plastic for a month to kill the maggots and stop more being laid. This will also help the heap heat up.

Hope this helps.

The amazing vitamin C tree

by Liz Sinnamon

Kenilworth, Queensland.

THE acerola cherry, a small tree or bush two to five metres high, is known throughout the Caribbean as the Tree of Life. Scientific tests show that the acerola cherry is the richest source of vitamin C of any fruit, having from 1,000 to 4,676 mg of vitamin C per 100 grams of fruit.

The human body cannot manufacture or store vitamin C, so this fruit provides a rich and ready source. One cherry will provide 40 mg, which is considered to be the average daily requirement of an adult. Acerolas, with their dark green leaves and pink or white flowers that bees find irresistible, can be an attractive addition to any garden.

The bright red cherry-like fruits make this remarkable tree quite eye-catching. It is small and compact and can be pruned to bush size, used as a hedge plant or even grown in a corner or shrubbery close to the house.

Propagation can be done by seed, but germination is poor because most seeds are not viable. The most successful propagation is with cuttings, rooted with bottom heat of 28 degrees and mist control. Plants are frost-tender when young and need protection, but once growth has become woody they will survive light frost.

Acerolas do well in a range of climatic conditions, but prolonged cold weather slows the tree's growth, so very little happens during winter. They are reasonably drought resistant, but will produce better yields in high rainfall areas, or if the trees are irrigated when the fruit is developing.

Mulching with straw or spoilt hay and regular feeding in spring and autumn with a high nitrogen fertiliser such as chicken, pigeon or duck manure is most beneficial.

Trees have been grown successfully on soils ranging from acid sands to heavy clays, but they will not tolerate wet feet for more than a few days. They have no serious insect pests, but the soil should be free from nematodes.

The fruit matures three to four weeks after flowering, which can start in the second year of growth. Once in full production trees can average 80 to 90 kg of fruit per tree from four or five crops per year. An orchard of mature trees can yield up to 20 tonnes per acre. The fruit is soft-skinned and needs careful handling after picking.

There are a number of varieties of acerola. California Honey and Florida Sweet are much sweeter than other available varieties. The flavour of the fruit varies with different types, but can be compared to crab-apple flavour, plum-quince and the taste of a ripe red cherry.

Green Home Expo 91

GREEN Home Expo 91 is a national exhibition for environmentally friendly products and services. It will run from 30 March to 7 April 1991 at the Royal Exhibition Building in Melbourne as a special feature of the popular Home Improvement and Furniture Show.

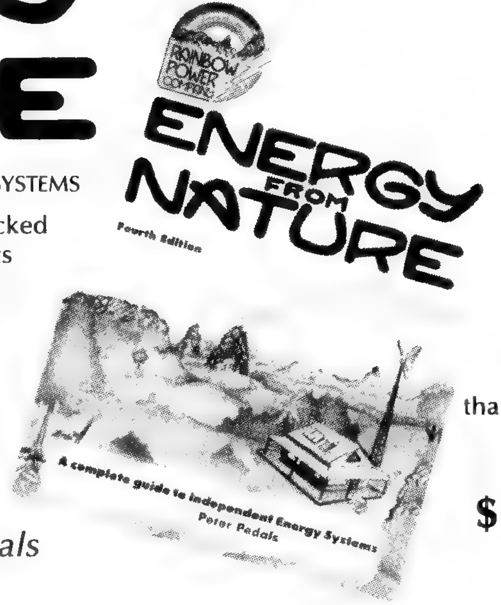
The aim of the Expo is to improve people's understanding and awareness of environmental issues through a display of manufacturers and organisations that are actively involved in trying to look after our environment.

"Green Home Expo is helping to promote an environmentally sustainable future, by encouraging consumers to support environmentally friendly products and services," said Robyn Williams, Chairperson of the Commission for the Future, the official host of the Expo. The Commission for the Future is a Commonwealth Government body that was set up in 1986 to provide a national focus for research and information on long term issues, with particular emphasis on an ecologically sustainable future.

The first Green Home Expo held last year was seen as an overwhelming success by the organisers with over 120,000 people visiting the show during its nine days. A highlight of this year's Expo is Energy Action Weekend (6 and 7 April). This will feature a series of practical workshops looking at solar options, conserving energy and cutting costs all under the heading of 'Energy and our Future'.

To maximise further the appeal of this year's Expo, exhibitors include manufacturers and distributors of environmentally friendly products; companies committed to demonstrating environmentally safe practices; associations and Government departments concerned with conservation and environmental issues; environmental action groups and your favourite self sufficiency and planet care magazine, ***Earth Garden***. Yes, we will be there to tempt and inform new readers and old with special offers and sales, or just to chat if that's what you feel like. So drop in — we'd love to see you.

Green Home Expo 91 will occupy the Gallery Level, Royal Exhibition Building, Melbourne from 30 March to 7 April 1991. Admission is $7 for adults, $3 for aged pensioners and free for accompanied children under 14.



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Follow the harvest and reap the benefits

Hard times are upon us. Australia's recession means many people are being forced into greater self-reliance, and have to look for alternatives to regular employment.

Many Earth Garden readers possibly are already on the road — following Australia's circuit of festivals and craft markets, or just seeing the continent while supporting themselves with casual work. Getting out of the rut, and experiencing life beyond the paling fence, have been popular philosophies with EG readers since Day One. Let us quote from Keith and Irene on page one of the first edition of Earth Garden back in 1972:

Fruit picking: an ideal way to earn money while seeing Australia.

"You can get by in the city, eat well and live in a good house or apartment and enjoy life . . . if you have a regular job that's satisfying and pays well. The combination is all too rare. Lots of people are lucky to have a job at all at the moment, and the economic climate doesn't seem to augur well for the future.

"It's a good time to make the change. Change your house, change your job, change your way of life. Throw the I Ching and see what it says.

"There is a better life. It's away in the country with plenty of fresh air, sunshine, home-grown fruit and vegetables, and home-baked bread.

"Save a bit and leave your job. Go out and see Australia, see what it has to offer. Is it worth saving? It's the only one we've got. Follow the casual fruit-picking trail. Come back to your new job refreshed with new interest in life."

The following harvest timetable shows where casual fruit and vegetable picking work is available throughout the country for the next six months. In the June issue we'll print a timetable for the subsequent six months. The information won't date — because the crops are harvested at roughly the same time every year.

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Harvest timetable

Harvest Period	Crop	Nearest CES Job Centre or Agency
	Victoria	
Feb-Apr	Tomatoes	Mildura Kyabram Echuca
		Bendigo
	Tobacco	Wangaratta
Mar-Apr	Apples	Rosebud
	South Australia	
Feb-Apr	Wine Grapes	Berri
	Peaches	Berri
	Wine Grapes	Gawler
	Tasmania	
Feb-May	Potatoes	Mowbray
15 Mar-5 Apr	Hops	Mowbray Glenorchy
	Queensland	
Mar-Apr	Ginger	Nambour
Mar-May	Tomatoes	Bundaberg
Apr-Nov	Beans	Gympie
May-Dec	Sugar Cane	Ayr

Harvest Period	Crop	Nearest CES Job Centre or Agency
	Western Australia	
Feb-Apr	Grapes	Albany Midland
	Apples	Manjimup Bunbury Collie
Mar-Jun	Rock Lobster	Geraldton
	Oats, Wheat, Barley	Merredin Northam
Mar-Oct	Prawning and Scalloping	Carnarvon
Apr-Jun	Oats, Wheat Barley	Collie Gnowangerup Katanning Collie Geraldton
Apr-Jun	Oats, Wheat	Midland
	Watermelons	Geraldton
May-Jun	Oats,Wheat	Esperance
May-Sep	Zucchini, Squash	Kununurra
	New South Wales	
Feb-May	Apples	Parkes
Mar-May	Apples	Tumut
	Beans, Zucchinis, Peas	Parkes
Apr-Jun	Cotton Ginning & Picking	Narrabri

Note: always check with the appropriate CES Job Centre before travelling to the harvest area.

How to get a job

by John Mason*

Lilydale, Victoria.

ECONOMISTS have recently stated that Australia is in the deepest recession since the Second World War. It's harder than ever to break into the workforce. Young people are told they need an education to get a job, but then jobs are hard to get because they don't have work experience. To be successful in today's workforce you need first to take a long term view, and secondly understand how different industries work.

Successful people rarely start at the top, or even the middle of the ladder. Most people who do well in their career start with jobs that are not so great. If you want to succeed, treat tedious jobs as a challenge. Treat the job seriously, put effort and passion into it. This will attract your employer's attention. If you find it hard to get the job you want, take any employment in the industry that interests you. A cleaner working for a computer company might move on to an office job and eventually to the position desired.

If you can't get a job, go into business for yourself. Mow lawns, wash cars, do baby-sitting, anything. It doesn't matter what you do, the person who has been doing something will always have a better chance of getting work later on than the person who has been doing nothing. Such a small business might not make much money, but it will give you experience and show potential employers that you have initiative.

Keep studying after you leave school, because the extra skills or knowledge gained could often be what makes an employer choose you before someone else.

Understanding your chosen industry

Put yourself in the shoes of the employer. They will look for people who will be able to do the job well, do it quickly and not take a lot of time to train.

You need to know exactly what day to day tasks you will be doing, and then, in the interview, convince the employer that you can do them. Your application must be relevant and emphasise the things which matter to that particular job. Be prepared to be your own boss if that's how that industry works. In some industries most people are self employed. Make a point of going out and meeting people who work in your chosen industry. Join relevant clubs or societies and visit shops or businesses within the industry. Study relevant courses or attend seminars where you will come in contact with people who work in that industry.

Key skills and attributes

Employers usually look for the following in new staff:

•some work skill training through courses that teach you theory and some practical knowledge relevant to the job. These are often preferred to highly academic courses that are not so relevant

•a proven work record to show that you can work hard, adapt to new tasks and are motivated to work even when the boss isn't about (experience in your own business helps here)

•maturity

•basic communication skills. Talk and write clearly and concisely

•basic maths skills

•some computer experience, to show that you are not afraid to use new technology.

For careers advice or course information in horticulture, business, journalism, recreation or photography contact Australian Horticultural Correspondence School, 264 Swansea Rd, Lilydale, Victoria, 3140; telephone (03) 736 1882, (02) 449 7810 or (09) 537 1360.

**John Mason is Principal of the Australian Horticultural Correspondence School and sees many students seeking to upgrade their skills and increase their job opportunities.*

Tribute to Bossie

by Rhonda Martin

Coonabarabran, New South Wales.

WHEN Bossie came to us she was eleven and already an old lady by commercial standards. She was a buff-coloured Jersey with black face and legs. We bought her from a farmer who had picked her up as a reject from a dairy farm. A mastitis attack left her operating on three pistons instead of four. Her horns were bad. The tips had turned in towards the skull, and were already touching the skin.

The farmer couldn't be bothered with trimming, but we could. We cut the tips with a hacksaw, which was a traumatic event for both us and the cow. It must have felt like someone sawing your teeth, but as we never touched the nerve it was probably all sound and fury.

Bossie was special from the start. She had that magic personality that makes life with animals so interesting. Over the years we came to know each other very well. She loved having calves and if there were none of her own around then she just adopted everybody else's. Consequently she never dried off because she was always feeding someone. Like all Jerseys she was a bit bull-mad. They thought she was absolutely wonderful and always kept close by.

She lost one of her calves to viral pneumonia so we bought her another from one of those terrible places where they sell very young calves. She raised Honey willingly and this calf eventually became our milker while her foster-mother went into honourable retirement. Of course, it's not economically sound having an ancient, 'useless' animal around the place continually eating its fill, but O my, I enjoyed her company.

We would often sit on the hilltop looking at the view, she chewing her cud and me leaning comfortably against her stomach, the rumblings of her rumen vibrating against my back. Cows are such peaceful beasties.

As she grew older her teeth became fewer but she still managed very well, and took to standing silhouetted on the skyline, looking very noble. Her horns still grew in the same awkward fashion, and despite their usefulness as handles, those dreadful tips had to be trimmed every year. We graduated from the hacksaw to a special piece of wire, bought from the vet. This is wonderful stuff and cut through the horn in 30 seconds, although she still looked reproachful all the time she was held in the crush.

In her retirement Bossie became restless and eventually demanded another calf. We hummed and haaed — after all she was 18 — but she insisted, so last January off she went to the bull, a handsome young fellow called Lionel. We had a great deal of trouble getting her home without Lionel coming too, bearing in mind her penchant for bulls and her ability to retain their fickle affections. This bovine Romeo was most insistent.

Everything seemed to be going well. She was becoming nicely rounded and eating well, still galloping down a 45 degree slope with her tail straight up, still licking everyone else's calf.

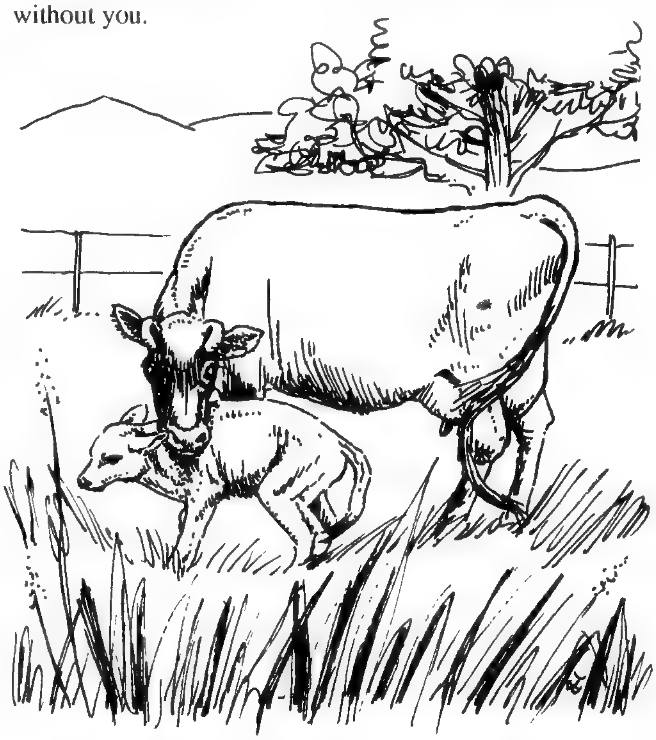
However, we found that her calf had died and was still inside her. Not having her in every day we missed the earlier signs of trouble and for some reason she could not get rid of the mess. She was very ill. We walked her gently up a hill and a friend shot her for us, cleanly and without fuss. I had always promised her she would never have to go to the abattoir, a dreadful fate for any animal, and she never did.

All this must sound mawkish, sloppy and hopelessly anthropomorphic, but Bossie was our friend. The only vice she had was to try to kill every black dog on the planet, but after a while she got a little slow for that. We will miss her terribly. She returned our affection a hundred-fold and was a wonderful old lady.

I think that sometimes people fail to consider what they will do with their big animals. Do you send an old friend, cow, horse or whatever to the abattoir, knacker or similar gruesome place? I have always felt this to be gross ingratitude, but after our experience with Bossie we may have to think again. A cow takes up a prodigious hole. Our place is only 12.8 hectares, most of it rock, with few places to bury anything large, and, although this probably sounds odd, I feel it demands careful thought.

Bossie now lies behind a great volcanic boulder on a neighbour's place. We are fortunate that they offered, we wouldn't have known what to do otherwise.

So, vale Bossie — the skyline will seem empty without you.



Bossie with her new-born calf, Freya, in 1988. She was nearly 18 at the time.

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Pocket sized inverter

A POWER inverter as small as a personal cassette player is now available from Queensland's solar power company, Choice Electric Company. The pocket sized inverter transforms 12 volt power from your battery bank into 240 volts using a high frequency potted transformer, providing true RMS regulated output. The unit is claimed to incorporate technology that the larger inverters do not. Under test, it has successfully powered a 34 cm TV and video and delivers a clean sound through a stereo player, which has been a problem with some other inverters. Choice recommends the unit for appliances rated at less than 100 watts, such as small TVs, videos, shavers, fans, fax machines, stereo equipment, answering machines and aquarium pumps, but the company does warn that some TVs, for example, have start up loads that exceed the inverter's capacity.

For further information contact Choice Electric Co, 3 Prospect Street, Bowen Hills, Brisbane 4006. Phone (07) 252 4909 or fax (07) 854 1038.

•Mr Peter Murnane, previously Regional Manager of Solarex Pty Ltd, in Sydney, has joined Choice Electric as a Director to manage the company's sales and marketing. He has also worked for BP in the UK and Saudi Arabia on early feasibility studies into the potential of solar energy.

"I am looking forward to bringing my corporate experience to Choice, a young company that is getting into the market place with smart energy solutions, and Queensland has an ideal climate for maximising solar technology," said Mr Murnane.

ZERO-TILL SMALLCROPPING WITH LARGE-SEEDED VEGETABLES

Zero-till cropping involves minimal soil disturbance to control weeds and enhance soil structure. In this article Leigh describes zero-till experiments since 1981, on small plots of 20 metres by 20 metres, in the moist subtropical climate of northern New South Wales. This operation is part of a subsistence agricultural ecosystem for a community of four families, and the corn crop described below appeared on the front cover of EG 74.

by Leigh Davison

The Channon, New South Wales.

ZERO TILL cropping offers two main advantages over modern methods in the search for sustainable agriculture. Firstly, undisturbed soil can resist many of the erosive forces of rain and wind. In high rainfall areas such as the north coast of New South Wales it is desirable to have agricultural soils which are at all times undisturbed and covered by a layer of mulch (living or dead) to frustrate the erosive forces of heavy rainstorms.

In their study, *Conservation Farming in the Humid Tropics*, Wijewardene and Waydyanatha describe how tropical rainstorms can lead to soil compaction as well as sheet and gully erosion. An impact-absorbing layer of mulch can prevent this.

Secondly, undisturbed soil can maintain its fertility under continued cropping. Work carried out in 1985 by Baker and Worrell of the Queensland Department of Primary Industries showed that minimum tillage techniques should be used to maintain soil organic matter content in acid soils such as those of north eastern New South Wales. Masanobu Fukuoka, throughout his book *The One Straw Revolution*, questions the necessity for cultivation, "... the earth cultivates itself naturally by means of the penetration of plant roots and the activity of micro-organisms, small animals, and earthworms."

There are other, important advantages of minimum till methods. A minimum-till plot can be planted much sooner after heavy rain than a cultivated plot and it will also maintain higher levels of soil moisture — ideal for crops grown during dry periods. An obvious economic plus of minimum till is the energy and labour saved in soil preparation.

One disadvantage might be that soil covered by mulch is slower to warm up in spring, due to the mulch's insulating effect, so you would expect slower germination and growth, particularly in cool temperate climates.

But this is a plus in autumn when it would maintain higher soil temperatures than in bare plots. Thus winter cover crops and cash crops such as zucchini would get a quicker start in mulched soils.

The operation

We have been growing a tasty and high yielding variety of non-hybrid sweet corn since about 1981.

In early spring (September) we slash the winter cover crop of lupin, vetch and oats and leave it a week to dry out and become brittle. This cover crop will have shaded out the chronic perennial weeds. The sweet corn seed is planted through the mulch of crop residue in rows roughly a metre apart. For the past few years I have been using the back saving 'rolling-injection planter' developed at the International Institute of Tropical Agriculture' in Nigeria. The planter places the seeds roughly 25 cm apart, but because of the size of hole in the measuring reel I often get two or three seeds in each site. The corn germinates in about a week and four to five weeks after planting, I thin them down to roughly four plants per square metre.

Planting and weeding are probably all that will disturb the soil. As we use no herbicides weeding is done with a sharp chipping-hoe swung in strokes tangential to the ground (lightly across the surface), confining soil disturbance to the top centimetre or so. The cutting action leaves the weed roots to decompose thereby controlling, not eliminating the weeds. Normally there will be a strike of

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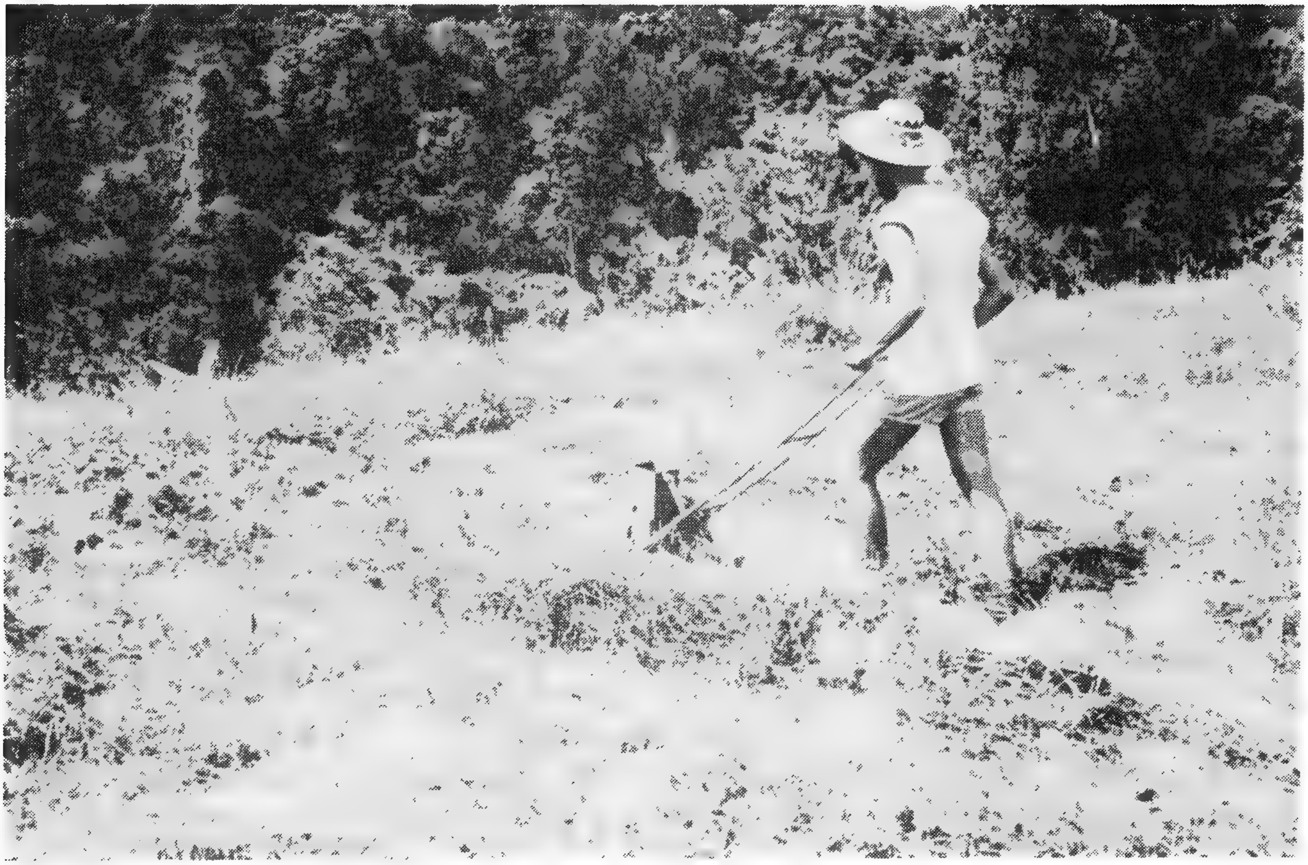

The back saving 'rolling-injection planter', which places the seeds roughly 25 cm apart, was developed at the International Institute of Tropical Agriculture' in Nigeria.

weed seeds, particularly 'Farmers' Friends'. We encourage this type of easily controlled, broad-leafed annual at the expense of less desirable weeds to act as a cover crop to prevent the couch grass from becoming a lawn. The lupin and vetch from the previous cover crop should not come back but the oats might until they are shaded out by the corn. Smother crops and live mulches are important in weed control.

It might be necessary to chip hoe more than once if weed growth threatens the corn, but make sure plenty of chipped weeds are left in the interrow space until the final chip (when the corn is about 20 cm tall). Remember, use a tangential hoeing action.

> **Masanobu Fukuoka, throughout his book *The One Straw Revolution,* questions the necessity for cultivation, " . . . the earth cultivates itself naturally by means of the penetration of plant roots and the activity of micro-organisms, small animals, and earthworms."**

The timing of this final chip is important, as it is now that we sow a leguminous cover crop, often dolichos lablab or caloona cowpea. Broadcast the inoculated and lime-pelletised seeds in the interrows and chip the weeds and cover crop residues. In dry conditions, the lablab or cowpea seeds need a generous soaking to give them a quick start before the rapidly growing corn stalks shade them out. Of course, if the legumes go in too early they may smother the corn before it is ready for harvest. Good timing is essential.

The legumes develop quickly into a rapidly spreading live mulch that climbs up the corn stalks. By harvest time the most vigorous lablab shoots will be at the top of the corn plants, about two metres high. As you harvest the cobs, you will probably trample the lablab a little but it recovers quickly to form a dense canopy that will shade out weeds. Also the lablab will create biomass, fix nitrogen and its two metre deep roots will aerate the soil.

Corn is planted every three or four weeks from early September through to late February. Harvest is three months or so after planting (that is, December to June). We use no pesticides so we often get an infestation of Heliothis grubs in the second month of the crops' life, but they don't cause excessive damage. Most damage to the cobs comes from rodents and birds but, again, this is not excessive.

Pumpkins and grammas

Pumpkins are well suited to minimum till techniques. We usually start a crop in mid-spring, say October. Small areas (or hills) about a foot in diameter are chipped, causing minimum disturbance, into the slashed plot and several pumpkin or gramma seeds dropped in each and covered with some of the disturbed soil.

Thin each hill to three or four plants within a couple of weeks of them emerging. When the vines start running we often mulch each hill with half a shovel of cow manure and an armful of grass clippings. We chip around the area covered by the vine once a week to discourage matting grasses, but, because of its broad leaf, the pumpkin tends to shade out many of these ground covers. Pull taller weeds by hand. This approach is suitable for other cucurbits like watermelon and zucchini.

Polyculture

Polyculture is a traditional agricultural system of growing two or more species together. Studies have shown that farmers who grow corn, beans and pumpkin together, have higher yields and fewer pest and weed problems than when the species are grown separately.*

Inspired by these findings I have been experimenting with various combinations of sweet corn, grammas, climbing beans and lablab. We plant the sweet corn into a bed of mulch in rows one metre apart. At the same time, we plant the gramma seeds in hills one metre apart along every second interrow.

Two weeks later we plant three or four climbing bean seeds into hills between the emerging grammas. As they grow, the beans climb up the corn stalks. The beans' initial growth rate is faster than corn, hence the two week delay in planting.

Chip hoe along the corn rows now if necessary. When the corn is about 20 cm tall, give the beans and grammas their final chip and plant lablab in the interrows that didn't get beans or pumpkins.

Generally, the beans are ready to pick at the same time as the corn cobs. After harvest we leave everything to do its thing. The gramma and lablab vines soon dominate the trellis of corn stalks, which eventually crumple. We harvest the grammas progressively from about four months after planting. In frost free areas this combination will tend to last through winter, although they lose considerable vigour in the cold months.

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Winter zucchini

Here in the Northern Rivers region of New South Wales, zucchini is a popular winter crop in frost free areas. Planting is from April through to June and harvest is about six weeks after planting. This is usually a period of heavy rainfall here but ground cover can be maintained using the following system.

Again initial site preparation is simply slashing the existing crop, probably the remnants of a corn and lablab system. A sickle-bar mower (also known as an Allen Scythe — see EG 56, page 9) is best for the job, because rotary mowers tend to get lablab vine caught around their spindles. The lablab hanging on the corn stalks allows the sickle-bar to make a clean cut on most of the vines. The ones left can be dealt with by hand.

> **"Most of our experiments have been carried out on fairly flat ground. However, anyone who's ever witnessed rain falling at a rate of three or four cm per hour will testify that there's no such thing as flat ground."**

We plant the zucchini seed 50 cm apart, in double rows. I plant two seeds to the hill with a spacing of 50 cm between hills. The double rows themselves are spaced roughly two metres apart. So, in other words, the spacing between each row is 50 cm, 1.5 m, 50 cm, 1.5 m and so on. As the seedlings grow, lightly chip around them. A few weeks after planting, we broadcast vetch seed (woolly pod or similar variety) into the central half-metre interrow.

Slash or chip the weeds in this strip over the vetch seed and water well during the following week to ensure germination. The vetch grows towards the rapidly developing zucchini and smothers any small weed growth. In prolonged wet weather keep the vetch and other weeds clear of the zucchini which needs to be well ventilated to avoid mildew on its leaves and fruit. The vetch provides a carpet to walk on when you harvest, and thereby reduces soil compaction. After harvest leave the vetch to smother the area. Any emerging weeds act as a trellis for the vigorous vetch vines.

No-dig potatoes

All you need to produce no-dig spuds is a lot of mulch. Lightly chip narrow contour strips into the slashed plot, using the chipping technique described for sweet corn. These strips can be roughly 60 cm apart, unless a leguminous live-mulch intercrop is planned. The seed potatoes are laid out 20 cm apart and covered so the sun cannot rot them. A couple of inches of loose mulch is plenty.

If there isn't sufficient mulch from the previously slashed cover, you'll have to import some from, say, another paddock. If extra mulch is not available, cover the seed potatoes with a little soil and any crop residue. If mulch is plentiful, cover the whole interrow as well to suppress weeds and conserve moisture.

Protect the tubers from the sun as they develop. Do this by 'hilling' when the crop is 20 to 30 cm high. Hilling means piling soil from the interrow around the plants. However the no-dig method demands that mulch — not soil — be used, but this depends on the availability of mulch.

There have been occasions (usually during a dry spring) when there isn't much in the way of pasture to slash for potato mulch. You then have to decide whether the cows or the spuds get the grass. Such a decision is swayed by such external considerations as condition of the cows and the need for milk. If we decide in favour of the cows then the spuds are either abandoned or can be hilled in the conventional manner by moving soil. However, there is a major consideration before you use the conventional soil method. In a no-dig plot of several years standing, weed populations will have stabilised and a desirable soil structure will be emerging. These long term gains should not be sacrificed for the sake of just one crop.

Hilling time is also right for planting the nitrogen fixing, live mulch intercrop. In autumn I broadcast vetch, just as I did for zucchini, and in spring I use cowpea.

After hilling there is not much to be done until harvest. Hand weed close to the plants every couple of weeks and ensure there is sufficient mulch shielding the tubers. The harvest is the easiest part of growing no-dig spuds. Just pull the mulch back and lift the potatoes from the soil surface. Use a trowel for the stubborn spuds but leave

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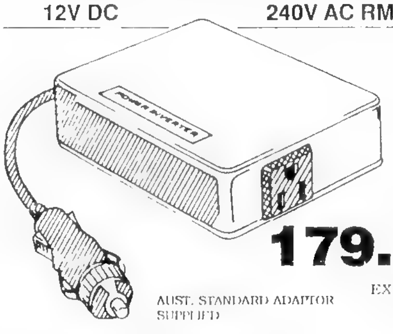

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the soil in its virtually undisturbed state. Although undisturbed, the soil is soft, moist and friable from the decomposing mulch and the cultivating action of the plant roots. The vetch or cowpea will now be running into the potato rows to provide total cover.

We plant two potato crops per year: in spring around September and in autumn around February. The spring crop faces a dry time and so mulch is not that plentiful. However, the blights and fungal diseases which plague the potato do not enjoy the dry conditions, so this is a good time to get a decent crop. Conversely, autumn is often very wet, so there is usually plenty of mulch available but fungal diseases can be a problem. I am experimenting with a biodynamic preparation of casuarina leaf tea, which, I am told, will strengthen the leaf cell walls and inhibit invading fungal spores. I spray the tea on fortnightly once the crop emerges.

Additional notes

Most of our experiments have been carried out on fairly flat ground. However, anyone who's ever witnessed rain falling at a rate of three or four cm per hour will testify that there's no such thing as flat ground. To slow the movement of water and to minimise the movement of soil particles all rows should be as close to the contour as possible.

In 1984 our soil was analysed by Australian Mineral Fertilizers of Hendon in South Australia. This showed that our soil was extremely acid (pH 4.2) and deficient in potassium, magnesium, calcium, boron and copper. Accordingly most of the pasture and horticultural areas on the farm were given a dressing of dolomite (for calcium and magnesium, and also pH) mixed with a combination of potassium, copper and boron supplied by Mineral Fertilizers.

This special mix consisted of the nutrient potassium and the trace elements copper and boron in non water soluble forms. For instance potassium was in the form of potassium carbonate. The cost of potassium in this form (including freight from Adelaide to New South Wales) is about double the cost of buying it locally as muriate of potash (potassium chloride), but as this form is fairly water soluble it is unacceptable to NASAA, the body which sets standards for organic agriculture in Australia.

Since mid 1985 we have applied the biodynamic preparation 500 to our paddocks, gardens and orchards about twice a year. This treatment enhances soil micro-life and hence the availability of plant nutrients, but because it acts on the soil apply it only when there is no cover crop, live mulch or weed cover present.

Conclusion

These methods of zero-till smallcropping have been proven over a number of years. They work quite well in small plots (roughly 20 m x 20 m). There has been no opportunity to scale up the technique to apply to more mechanised situations of an acre or so but I would be happy to co-operate with anyone wishing to experiment along these lines.

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*One of the best known and most thoroughly studied traditional polyculture systems is the corn, beans and squash combination common to parts of Mexico and Central America. In his essay *An Agroecological Approach* in *Meeting the Expectations of the Land* (Jackson *et al* 1984), Stephen Gliessman describes an analysis that he did of a corn, beans and squash polyculture in the lowland region of Tabasco in Mexico. Monoculture controls were used for comparison.

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1 Sterling Street, Dubbo, NSW, 2830.

Do it yourself Green Days

by Harry Johnson

Aspley, Queensland.

EVERY day it seems the general community increases its environmental awareness. This is particularly so among school children who, in many cases, seem to know more than their parents about environmental issues. However, the public generally still seems 'information poor'. So often 'Environmental Days' end up as a get together for the Greenies with minimal participation by the public.

Earth Gardeners have been doing the right thing in their own quiet way for many years but more people need to be reached in this vital decade if we are all to live more lightly on the Earth. The following proposal outlines how this might be achieved through gatherings called 'Green Days'.

Aims

The aims of a Green Day would be

- to encourage conservation groups and the general public to get together in a 'positive' atmosphere
- to encourage people to look after the Earth by showing how easy it can be to do so
- to show what alternatives for a 'Greener' lifestyle are available to the individual.

Recommendations

The ideal venue would be a large park with an area that requires tree planting, for example an eroded creek bank or bike track. It should be accessible by public transport and have plenty of nearby parking. Trees for planting could be provided by Greening Australia, forestry departments, local councils, schools, Men of Trees or other similar organisations.

Features of the day could include

- guest speakers, including high school students
- live music
- Earth repair games, theatre, mime
- children's earth mural painting
- bicycle rally
- tree planting and bush regeneration
- demonstrations in composting, mulching, worm farming, recycling, plant propagation, paper making, bird identification and so on
- competitions for schools to design a logo for 'Environmentally Friendly' products and displays of environmental projects.
- school bands, gymnastics and dancing.

Display stands could be available to groups representing, for example

- conservation, peace, social justice
- co-operatives, schools, scouts and guides, gardening groups
- arts and crafts, homemade food
- Environmentally Friendly products such as solar heaters, home insulation and water savers.

A small fee could be charged for each stall, perhaps the profit-making groups to pay more than the others, to cover any expenses. Entrance fee to the public should be at least one readily recyclable item, such as a glass bottle or jar, aluminium can or egg carton. Also, each person would need to bring their own mug and plate.

Planning

Groups and schools would work together organising the day, arranging the venue and publicity, preparing trees for planting, digging holes, preparing displays and liaising with relevant businesses regarding their displays. A lead time of about six months will be required. I feel there is a need for such a Green Day, to show that there are many people who are prepared to back their beliefs and protests with more positive action.

Any persons or groups interested in discussing this proposal and its development should contact: Harry Johnson, Recycling and Pre Vocational Coordinator, Aspley Special School Recycling Station, Aspley, Queensland, 4034; phone: (07) 263 2655.

Growing lavender

A new home study course on growing lavender is now available. It is a comprehensive course aimed at the enthusiast or commercial grower and involves approximately 120 hours of study. The ten lessons are usually spread over 12 months and cover subjects such as classifying and identifying lavender and its varieties, soils, fertilisers and nutrition, pruning, mulching, irrigation, propagation, planting and establishment.

Sections of the course deal with broadacre cropping, nursery production, harvesting, post harvest treatment, and processing, making and marketing of lavender products.

•Further details on this and other herb courses can be obtained from the Australian Horticultural Correspondence School, 264 Swansea Rd, Lilydale Victoria, 3140; telephone (03) 736 1882.

BELLINGEN VALLEY RAINFOREST SEEDS

Most people know that Australia has only tiny remnants of its rainforest intact after 200 years of mindless logging. Mark and Johanna have established 'Bellingen Valley Rainforest Seeds', a non-profit organisation, to help people re-establish degraded rainforests. Replanting a rainforest is a slow process, but it has to start sometime.

by Mark and Johanna

Bellingen, New South Wales.

WE MOVED to the Bellingen Valley in northern New South Wales from Sydney three years ago. For some reason it feels like we've lived here all our lives. We must have travelled hundreds of kilometres looking for land and were just about to give up when we found a place with lots of trees and a small house hidden in the bush.

The house had no mains electricity, which suited us because we wanted to use solar energy. Even before we could think about moving in the rats had to be chased out and the plumbing repaired. This took ages and we still grumble about the water problems.

The vegie garden and orchard are another story but anyone who finds geese endearing creatures — take heed. We only bought five geese, and it was about a week before we noticed they were eating all our young fruit trees. We panicked, netted all the trees with chicken mesh, and now all the geese have gone to good homes.

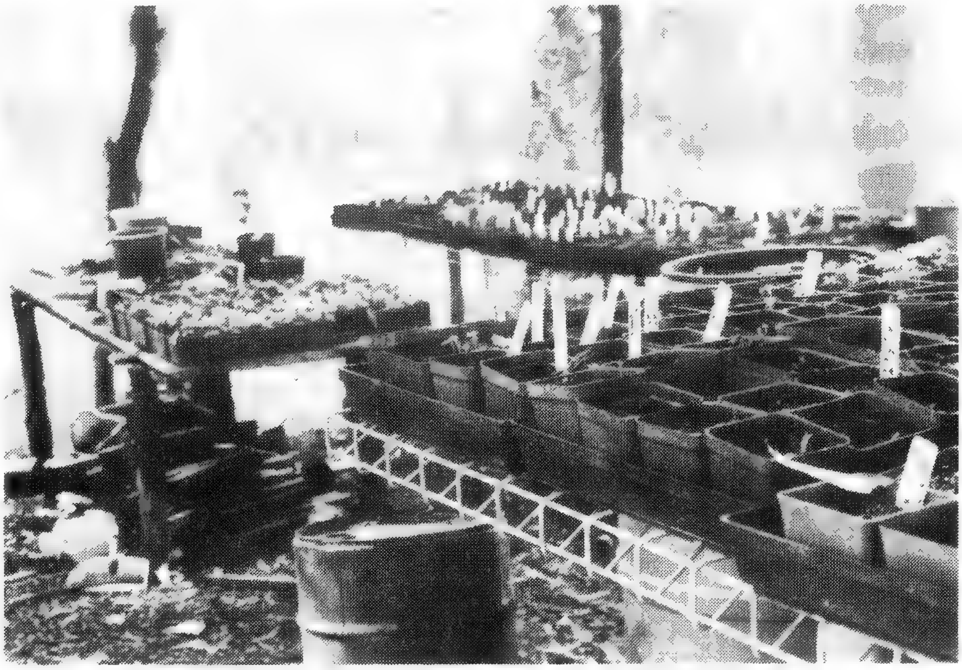
We use organic methods and find Jackie French's stories really helpful. Right now we are growing potatoes in tyres with a mixture of horse manure and sawdust and Johanna is already starting to bandicoot them. We have about 300 fruit trees which we try to mulch with sawdust. It's available in large quantities because our place is on the boundary of the Pine Creek State Forest. They are constantly logging around here and bush mills are scattered throughout the forest.

Our interest in rainforests really started when we saw Dorrigo National Park. The feeling we had after experiencing the rainforest made us want to regenerate our own place. We have been regenerating our property for three years now, with trees we've grown from seed we collected. With the help of some good books we've been able to identify countless rainforest trees on our place and around Bellingen.

Collecting the seed was difficult at first because we had to learn by trial and error which ones were ready to collect and which ones weren't. One particular tree to be wary of is *Jagera pseudorhus* — Foam Bark. This tree is common along the edges of forests and roadsides. It produces foam from most parts if agitated and was used as a fish poison by Aborigines. Unfortunately the seed capsules have irritant hairs which are quite painful and difficult to remove.

Bellingen Valley Rainforest Seeds

We started Bellingen Valley Rainforest Seeds nearly two years ago and it just keeps growing. We now spend



Propagating rainforest seeds at Bellingen Valley Rainforest Nursery about four days a week collecting seed and answering the mail. Getting the mail is great because we only advertise in a few good magazines and mostly receive letters from people who are interested in regenerating their own land. We fight over who is going to open the mail, and Johanna mostly wins.

All the excess seed we collect, we grow ourselves and we now have about 3000 rainforest trees growing in pots which we donate to local tree planting groups. We also plant out trees ourselves at a reserve in Coffs Harbour. We are currently planting street trees in the Nambucca Shire and later this year we plan to plant street trees in the Bellingen Shire, so we are growing as many trees as we can.

We hope to extend our catalogue so we can provide as much information as possible. It is now eight pages long and nearly a small book. The artwork on the cover was donated by an artist in Dorrigo and a local nursery supplier does the photocopying at cost. I suppose this would be a good time to ask people for a donation to help with expanding the organisation.

•If you would like Mark and Johanna's catalogue, please write to Bellingen Valley Rainforest Seeds, Private Mail Bag, Bellingen, NSW, 2454, enclosing two stamps to cover costs.

How to create a rainforest

APPROXIMATELY 80 percent of Australia's rainforests have vanished. Rainforest ecosystems in Australia support over half the known native plant species and a third of Australia's mammals, bird, insects and reptiles.

Before white settlement in Australia there were a million hectares of rainforest in New South Wales alone. The whole of Australia's rainforests today would fit into an 80 km radius circle. Most people who visit a rainforest come away with the determination to preserve them and some come away with the desire to nurture a rainforest of their own.

These notes are a general guide to help establish your own rainforest plot.

Soils

Rainforests usually thrive in soil that has a high level of organic matter and a ph of 5.5 to 6 (slightly acid). Nutrient deficiency symptoms are common in the leaves of rainforest plants grown in soils with a ph higher than 7. Rainforest plants are generally tolerant of clay soils where drainage is not heavily impeded. On heavy clay soils organic matter can be dug into the planting holes and the surrounding area to encourage a more friable soil structure for better drainage.

Sandy soils can drain too efficiently so nutrients are often drained away. This can be diverted by generous applications of mulch, compost and organic fertilisers. There are species suited to waterlogged areas, such as palms and the creek sandpaper fig.

Mulches and organic matter

Mulching plays a vital part in the success of a rainforest. Rainforest plants extract most of their moisture and nutrients from the upper level of the soil or the lower layer of the mulch. Rainforest plants can tolerate quite adverse soils due to their dependence on mulch. Mulch supports a myriad of soil micro-organisms which sustain a healthy soil. Chemical fertilisers and herbicides impede the survival of these organisms which leads to an unhealthy and unbalanced soil. Examples of mulch are leaf litter, well decomposed grass cuttings, hay, most well rotted garden refuse and sawdust from untreated timber. You will find mulching helps reduce the watering requirements of plants, helps control weeds and maintains a constant temperature around the roots.

Due to previous agricultural practices most soils will be low in organic matter. To create a sustainable rainforest a large amount of organic matter must be present, most of which will have to be grown or brought into the area you are regenerating.

Fertilisers

Mulches tend to use up the soil's nitrogen in the process of decomposition, therefore a small amount of poultry manure, blood and bone, or some other organic fertiliser is recommended to counter this and fertilise the plant. Chicken manure is a slow release fertiliser that lasts considerably longer than any artificial fertiliser. If pelletised manure is used an application rate of one kg per tree is recommended.

Sites

The ideal sites for a rainforest are the following: south facing slopes, gullies and basins, and rocky and steep slopes. The latter sites may be awkward areas for planting, however their chances of surviving the bulldozer or chainsaw are greater.

Rainforests will, and do exist in surprisingly hostile conditions, such as:

- exposed sunny areas
- salty windy places
- coastal headlands
- wet and cold conditions
- poorly drained and clay soils.

Paths

Before tree planting, construct paths. The meandering paths will not only be for you, but also for equipment, tree planting and maintenance. They also reduce the amount of disturbance to the area. A track about one metre wide is ample.

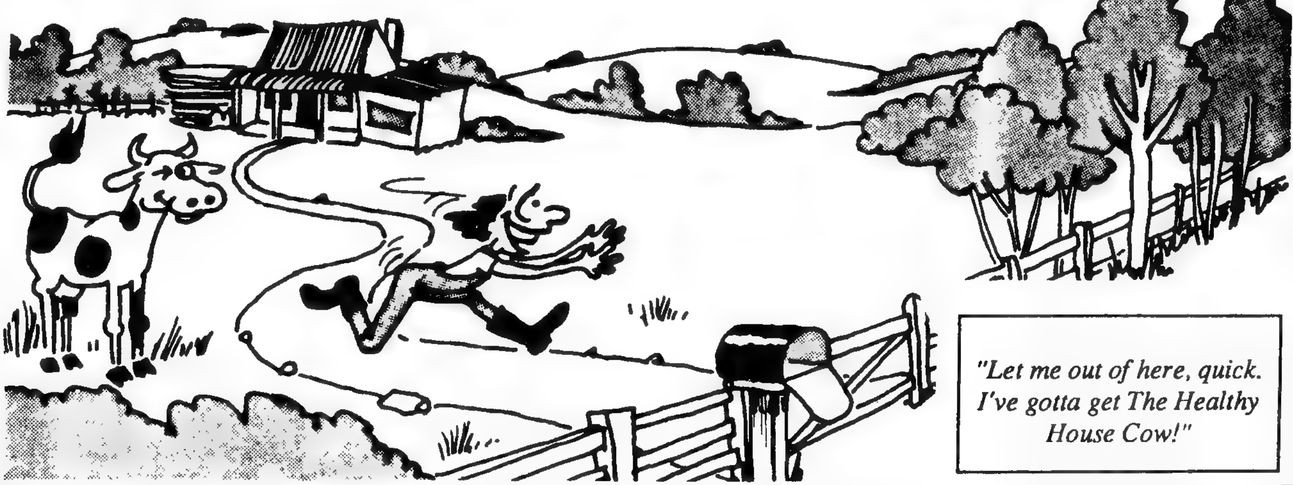
Weeds

Controlling weeds is one of the most important and

The Healthy House Cow

written and illustrated by Marja Fitzgerald

Australia's first house cow book written from an organic, wholistic perspective. Everything from fencing to cheesemaking and organic health solutions. 'The Healthy House Cow', published by Earth Garden, is now available. 144 pages, large format paperback, and full of useful information for prospective or current house cow owners. $18.00 posted - see page 56 for ordering details.


"Let me out of here, quick.
I've gotta get The Healthy
House Cow!"

time consuming aspects of rainforest regeneration. If you decide to clear weedy undergrowth on a large scale, either by hand or machinery, expect many different weeds to suddenly germinate. It is important to take on only as much weed management as you can handle. Total weed eradication is not feasible until a closed canopy has formed. Weeds play an important part with their ability to colonise cleared areas quickly, reducing the effects of soil erosion.

The success of any rainforest method allows for the combination of ecological principles of rainforest regeneration. The method of weed control will depend on the various environmental aspects within one plot.

Species selection

The plants you select for your rainforest area will depend on the localised factors of the site. If you live where rainforests exist naturally, local acclimatised species may be the best to plant. Frost can be a problem but many hardy species are available and once a closed canopy is established, most frost sensitive plants can be added.

For windy sites, plant fast growing species on the windward side at closer plant spacings (for example, one metre apart). Low growing species would also be a good choice for this situation. In adverse conditions watering and fertilising becomes important in overcoming disappointing results. Pioneer trees are specially adapted to colonising cleared land and are vital in the species selection for a plot. They are fast growing, hardy, sun tolerant, and in most cases frost and wind tolerant.

Green manure

An effective way of adding nutrients and organic matter and reducing soil erosion is to sow a green manure crop. You can use a rotational system of planting and slashing that will be highly beneficial to your rainforest regeneration area. For subtropical climates, broadcasting lablab in summer and oats in winter helps revitalise the soil. It is important to slash a green manure crop before it goes to seed.

Plant spacings

It is estimated that 1500 trees will fit into one hectare of land with space for all the understorey plants to be included later on. The first stage of planting out consists only of trees. After six to eight years the plants should begin to take form and begin to look like a rainforest with canopies mingling. At this stage you can plant out all shade loving plants that go into the understorey.

If your rainforest is to become self sustaining, canopy establishment is a priority, because it will facilitate the right environment for a healthy rainforest ecosystem. Spacing your trees at three metre intervals is a general guide to tree distances, but this will vary according to the different conditions. For example if a planting area is exposed to full sun on one or more sides, closer spacings will be instrumental in reducing weed infestation. To avoid wind damage closer spacings would be effective.

•Part two of 'How to create a rainforest' will appear in the next issue of Earth Garden.

ORGANIC CONTROL OF CommonWeeds

by Jackie French.

Jackie French's latest book gives a complete guide to controlling 'weeds'. Learn how to make a weed-free garden out of weeds, and use weeds as pesticides, mulch and compost. This complete growing strategy is an important addition to the library of any organic gardener or farmer. See page 56 for ordering details.

ORGANIC CONTROL OF Household Pests

by Jackie French

A guide to using and growing your own chemical-free organic repellents, baits, sprays, and lotions. The essential text if you don't want to resort to ozone-destroying cans of chemicals, written in the usual readable, no-nosense style of regular Earth Garden writer, Jackie French. Hot off the presses for people who prefer the pleasant bouquet of cedronella to the acrid stench of Mortein. Available now from EG.

$14.95 POSTED, FROM EARTH GARDEN — SEE PAGE 56 FOR ORDERING DETAILS

EARTH GARDEN REVIEWS

— Edited by Sophie Masson —

A Guide To Keeping Poultry In Australia
by Dorothy Reading
Viking O'Neil, $19.99.

Here is a terrific guide to keeping poultry, written with an attention to detail. It could be used by any poultry keeper, from the beginner to the more experienced. The humble chook is of course the one covered most in this book, but there are also chapters on ducks, turkeys and geese, as well as quail, pheasant and guinea fowl. Topics covered include a general chapter on fowls, breeding, care and flock management, possible problems, dealing with produce, and more. A must for every poultry-keeper's shelf.

Great Vegetarian Dishes
by Kurma Dasa
published by Bhaktivedanta Book Trust
192 pages, hard cover
$27.45 posted
from PO Box 262, Botany, NSW, 2019,
Phone (02) 666 6466.
Reviewed by Alan Thomas.

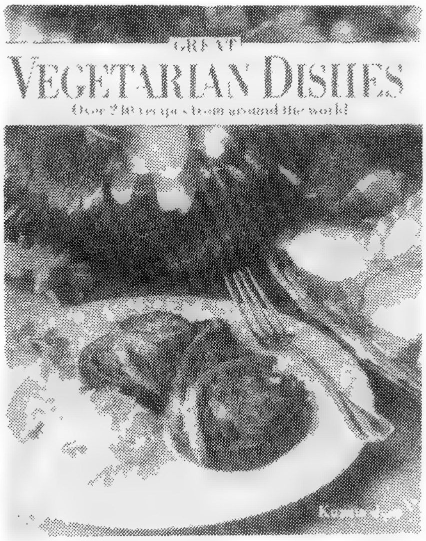
Anyone who has eaten at a Hare Krishna restaurant in Australia or anywhere else in the world, will know how tasty and wholesome their vegetarian food can be.

Great Vegetarian Dishes is a comprehensive book of recipes written by Kurma Dasa, the head chef of Gopal's restaurant in Melbourne. Kurma's 12 part TV series on cooking has been shown throughout the world and some of you may even have attended one of his popular cooking courses.

I remember Kurma from my student days — Gopal's always had the cheapest, tastiest food in town. Kurma's comprehensive approach is reflected in this book which features a broad range of suggested menus for complete meals from light lunches to full banquet style feasts. There are many exotic dinner parties contained in these pages.

Kurma's truly international range of recipes features food styles from every continent, but as you'd expect the emphasis is on Indian-style cooking which of course relies on liberal use of ghee and various oils. Some of the recipes have already been tested in the 'Earth Garden kitchen': the pea and potato croquettes in particular were a great success at a recent dinner party!

The directions for each dish are written in a clear, easy-to-understand style, so there can be no excuse for not turning out near-perfect results every time. And the presentation, particularly the photography, is such that just browsing through the pages is likely to compel you immediately into the kitchen to create one of the exotic, delicious looking dishes — a solid recommendation for any book of recipes.



Mice Don't Like Spearmint
by Margaret Knight
illustrated by Regina Newey
William Heinemann Australia, $22.95.

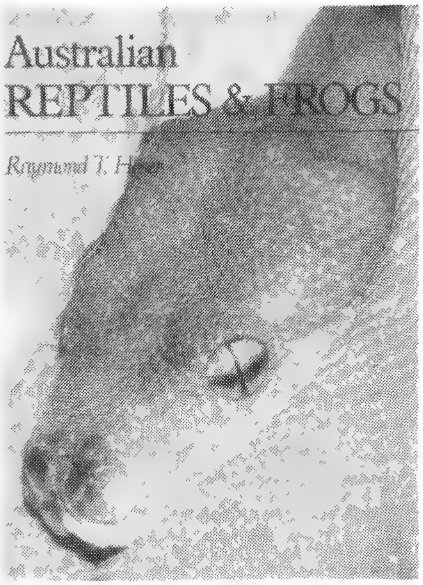
This book is subtitled 'new ideas for gardening', and it's an innovative and idiosyncratic sort of gardening book — very charming and entertaining as well as informative. Organic gardening is at the heart of Margaret Knight's gardening philosophy, something she makes quite clear throughout the book. The book is divided into several sections: Issues and Environment; Plans and Planting; and Techniques and Strategies. Within each section are several sub-sections including such unusual features as Zen gardens, preserving historic gardens, and uncommon gardens. This book is highly recommended, both for its readability and attractiveness, and for the usefulness of its advice. I love the title, too!

The Energy Alternative
by Walter C Patterson
Boxtree Press (through Random Century), $49.95.

This is an excellent and very timely book. It is written in a lucid and informative way, and covers the history of humanity's use of energy. It canvasses the options available to us now, in an age of terrible environmental consequences from our overzealous use of fossil fuel. The Greenhouse Effect, acid rain, the depletion of the ozone layer — they're all good reasons why we should change our concepts of energy.

"Must we," as the author says, "continue cutting butter with a chainsaw?" Of course the answer is no, and Patterson's excellent book will certainly go a long way towards informing people of the choices that can be made. This book is not a handbook. It is intended as an analysis, overview and discussion of the energy question. Highly recommended.

Australian Reptiles and Frogs
by Raymond T Hoser
238 pages, available through publisher, Pierson & Co., PO Box 87, Mosman NSW, 2088, (02) 969 6521, $49.95 (post free). Reviewed by Greg Simmons.



Raymond T Hoser believes that, "the pinnacle of a herpetologist's career is photographing copulating reptiles". Well, he's gone one better in his marvellous book, *Australian Reptiles and Frogs*, by including photographs of snakes copulating and eating at the same time, a feature claimed as a world first. For those unfamiliar with the term, a herpetologist (Herpie to their friends!) studies reptiles and amphibians.

The book is the result of the author's 20 years involvement with Australian reptiles and frogs and it is obvious from the pages of this superbly presented book that he is indeed passionate about his subject. The detailed descriptions of more than 200 species are accompanied by over 600 excellent full colour photographs. The text is concise and most readable to appeal to the novice as well as the expert. Chapters look at the origins of Australian reptiles, their natural history, classification identification, habitats, how to look after them, breeding them and, of course, how to photograph them. Also there is an important chapter on the conservation of our frog and reptile populations, an aspect obviously dear to the author.

This fine publication is a must for the library of any existing or potential Herpie, and anyone interested in Australia's herpetofauna.

The Selfish Gene
by Richard Dawkins, Oxford University Press, $16.99.

This is a new edition of Dawkins' famous book, and is recommended reading for all those who want to understand a little about the important science of genetics, and the great leaps in understanding that have been made in this area. Dawkins is a lively, provocative writer who can have you roaring with rage or smiling in approval within the same page, and this view of evolution and how it has been programmed at a genetic level is fascinating. It is not a difficult book to follow, and ranges over a wide variety of examples to make its point.

Dawkins' basic premise is that, as humans, we are 'survival machines' governed by our 'selfish genes', but whose 'onboard computer', that is, the brain, has allowed us to escape the tyranny of the gene. It is a very mechanistic and, ultimately, to me, unacceptable view of our lives, our impulses, actions, and feelings. He has great problems with culture — and advances a theory to explain it which, to me, sounded positively absurd and rather unscientific. Ultimately, his theory does little to advance our experience or understanding of our lives and its meaning. This book is very much worth reading, but I took it with a good pinch of salt!

The Better Back Book
by Constance A Bean, Pan Books, $19.99.

Back pain is a common problem, but failure to grasp the problem is also long-standing. This book can go a long way towards addressing those problems, and while not preempting medical or therapeutic solutions, can help a sufferer understand the complexities of back pain.

The book is divided into several chapters, on topics such as "Back Attack—not what?" back exercises, back protection, getting moving, causes of back pain, pregnancy and back pain, and many others. The writing is clear, concise and interesting, with many examples and illustrations of exercises. There is also a glossary and bibliography. Recommended for all back pain sufferers.

The Golden Bough
J G Frazer
Papermac, $24.99.

This is *the* reference book par excellence on magic and religion. It was first published in 1922 and has been reprinted umpteen times. This is the latest edition. I recommend this book to anyone interested in the engrossing, thrilling and frightening story of humanity's spirituality. As well as evoking the strangeness and rightness of belief throughout the ages, it also shows the mysterious connections between cultures which appear very different.

There are sections on incarnate (that is, made flesh) gods; on magical principles and practices; on tree-spirits, taboos, the immortality of the soul, the place of women, animal spirits, scapegoats and much more. In a time when we are becoming more interested in ancient patterns of belief, to find a spiritual system which will renew our sense of connection with the Earth, this is an important book.

Cuisine Grandmere
by Maire-Pierre Moine
Barrie and Jenkins (through Random Century) $39.95.

The subtitle of this book is 'Traditional French Home Cooking'. Not haute cuisine perhaps, but a marvellous blend of imagination and practical good sense that characterises French home cooking. There are soups and starters, main course meals with meat, game and poultry, as well as those based on vegetables and legumes such as lentils; there are also lovely sweets and fish dishes. All of the ingredients are readily available and the resulting dishes are tasty, nutritious and easy to prepare. I know many of these dishes from my mother's own home cooking and I can assure you, they're well worth making and eating!

Marie-Pierre Moine includes a few notes and a preface, which are also most interesting.

The Handbook Of Fortune Telling
Francis A Bevan
Collins/Angus and Robertson, $16.95.

Here's a book for all those interested in the esoteric arts of fortune telling with tarot cards, playing cards, astrology, numerology and psychic perception. There's a section on each kind of fortune telling, and a short section at the end called 'consumer beware' — how to choose a fortune teller, and how to set up as one yourself!

The Emperor's New Mind
by Roger Penrose
Vintage, through Random Century, $14.95.

This is a different sort of book to the ones I usually review for EG. It's a fascinating exploration of the human mind, and how artificial intelligence can never simulate this. Now, the author is not some computer-hating Luddite. He's a highly-respected and award-winning scholar and researcher, a professor of mathematics who has worked with Professor Stephen Hawking. It is really absorbing and thought-provoking stuff, and should be required reading for all over-the-top computer buffs and scientists.

Penrose delves into the mysteries of the mind and comes up with the notion that the child's eye view (the emperor has no clothes) is sometimes the only valid and real one. I recommend this book to anyone interested in the whole area. It's a fascinating, detailed and exhaustive work and has given me much ammunition for many discussions to come!

Eat My Words
by Marion Halligan
Imprint (Angus and Robertson), $14.99.

This is one of my favourite books — a highly literate and sensual trip through gastronomy. The book is filled with excellent recipes, including a most subtle and refreshing elderflower sorbet. It brought back memories for me of days spent in a village in the Rouergue, in south west France. There is fascinating information about all kinds of foods and the way people eat, and a story about the education of an Australian gastronome, from the time she ate her first olive! For me, brought up on olives and the sort of food Marion Halligan writes about, it was a fascinating read. To be consumed like a delicious ice; slowly, so as to preserve the full flavour!

How To Write and Sell Your First Non-Fiction Book
by Oscar Collier, with Frances Spatz Leighton, St Martin's Press (through Pan Books), $26.95.

Many people dream of writing a book, and many Earth Gardeners have the knowledge and experience to write a good non-fiction book. With this book, you can take the first steps towards that goal. Writing non-fiction is a booming business. But the market can be so tight and the rules so complex, that a beginner with a good idea can feel that they will never get their project off the ground. Here's help, in the shape of a comprehensive, well written and interesting book.

There's advice on all kinds of things — writing a non-fiction book proposal; gathering material and writing it; publicity; contracts; literary agents; and much more. It's written in a chatty, lively style, and is a good example of a non-fiction book. There's also a short checklist at the end, with some thoughts on what makes a good non-fiction book (such as a great title, good organisation, a provocative lead, good anecdotes, quotes, unexpected insights, humour . . .) and a list of books to further your knowledge.

Not All In The Mind,
by Dr Richard Mackarness,
Pan Books, $12.99.

This is the re-issue of an extremely successful book which first appeared in the 1970s. Since then, it has become a classic text on the difficult topic of food allergy and its effects on physical and mental health.

This book is easy to read, well-researched, and draws some startling conclusions. It has a companion volume — *Chemical Allergies* — and, together, these two books could be the first step in overcoming allergies.

The EARTH GARDENER'S Companion

JACKIE FRENCH

The EARTH GARDENER'S Companion is a month-by-month guide to organic planting, gardening and harvesting. It is a fruit and vegetable-growing calendar for the not-quite self-sufficient. It's an excellent introduction to natural pest control for any time of year your garden is being munched by non-humans. With the Companion you will know what to do in your garden at any time of year and get a total picture of organic garden health: not the artificial view you get from the back of a chemical fertiliser packet.

FEATURED ON ABC RADIO AND 'BURKE'S BACKYARD'!

"There are plenty of useful hints which even non-organic growers will furtively pursue, and the common sense, non-dictatorial approach to organic gardening makes enlightening and stimulating reading."

"This infinitely readable and entertaining month-by-month guide to organic gardening is bound to attract the attention of commercial growers who are producing organic fruit and vegetables."

-Horticulture Today.

Jackie French is an expert and successful organic gardener who practises what she preaches, and understands that in home vegetable gardens, labour is usually in far shorter supply than enthusiasm.

The EARTH GARDENER'S Companion is available from Earth Garden for $8.95 posted. See page 56 to order it. The Companion is printed on recycled paper.

LAND LINES

LAND LINES are for people buying, selling, seeking or sharing houses and land. It is your responsibility to check all deals. We charge 40 cents per word (prepaid) for a listing of any length. All LAND LINES must include your name and address. Phone number is optional. LAND LINES for the June issue should arrive at RMB 427, Trentham, 3458, by 3 May.

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Couple with young daughter looking for land (min 50 acres) to rent or on share basis. Experienced in agriculture, animals, machinery and host farming. Husband also a builder and painter. Prefer 300 km from Sydney. Ph (02) 9774243.

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Unclassifieds are 40 cents per word, prepaid. The deadline for the next issue is 3 May.

LOW SPEED GENERATORS for wind mills, water turbines, steam engines. The definitive book: 'The Homebuilt Dynamo' (1987) 182 pages, 8 1/2 x 12 inch hardback. Generator design and construction with ceramic magnets. Complete plans, 268 photographs, step-by-step construction details. Post paid airmail $85. Todd-Forbes Publishing, Dept D7, Po Box 3919, Auckland, NZ.

BOOKS, Old and New, Send for general list. R Suters, PO Box 127, Figtree, NSW, 2525.

SEED: fruit & nut. Over 200 species. Personal collection in season assures viability. For list, send SAE to Fruit Spirit Botanical Garden, Dorroughby, NSW, 2480.

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PERMACULTURE - 'Designer's Manual', 'The Best of Permaculture', 'Permaculture One and Two'. See ad on page 40.

APRIL COURSES - Companion Planting Sun 7th $21 (3 hrs); Organic Food Growing Sat 20th $45 (full day); Herbs Sun 28th $45 (full day). Enquiries: Earthkeepers (046) 819623.

COMPANION PLANTING GUIDES - All dirt and waterproof. a. 'General Guide' has over 130 fruit, vegies, herbs, nuts and berries, also an insect control table. b. 'Vegetable Garden Designer' show several companion planted vegie garden plans: c. 'Organic Roses', its companion plants, disease and pest control. All three for $14.50 posted. Earthkeepers, Addison St, Thirlmere, New South Wales, 2572. Phone (046) 819623.

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EG5: The wind — windmills . . . windpumps . . . generators . . . raku pottery . . . Cinva ram . . . poultry . . . Hamburghs . . . moon planting . . . fallout shelter . . . vegan way.

EG6: Solar 1 — sun cults . . . solar cooker . . . sundials . . . Lost World . . . Clifton Pugh . . . concrete house . . . Shalom . . . Cajun cookin' . . . horses . . . spirit of Nimbin.

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EG8: Gas power — methane digester . . . by truck to Tassie . . . cumbungi hats . . . inkle loom . . . candles and tapers . . . country cottages . . . A-frame . . . school gardens . . . sourdough.

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EG 10: OUT OF PRINT.

EG11: Water — hydraulic ram . . . waterwheels . . . okra . . . seed primer . . . heavy horses . . . tomatoes . . . soft technology . . . wine . . . hard cheese . . . start with hens.

EG12: Keeping food — drying . . . salting . . . bottling . . . storing . . . tahu . . . tropic delights . . . plant propagation . . . plans for a solar water heater . . . solar stills and cooker . . . Moora Moora.

EGs 13—15 OUT OF PRINT.

EG16: A Lytel Herbal (Part 2) — comfrey, lavender, wormwood, yarrow . . . poultry shed . . . peafowl . . . goats . . . basic beekeeping . . . rammed earth building . . . hydraulic ram.

EG17: Fencing . . . dry stone walls . . . make soap . . . nets . . . pole shelter . . . breeding black sheep . . . The Autonomous House . . . asparagus . . . Aeolian harp . . . ducks . . . Khaki Campbells.

EG18: Fruit garden . . . oranges . . . lemons . . . olives . . . nuts . . . tropical fruit . . . fodder trees . . . road building . . . wood fired kiln plans . . . Cinva-ram cottage . . . sunflowers . . . homebirth.

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EG20: Apples . . . pears . . . cordon and espalier . . . build a haybale pig house . . . pollen . . . rose hips . . . mudbrick flats . . . solar homes . . . gourds . . . preserve fence posts.

EG21: Womancraft — all articles by women . . . earthly arts . . . axewomanship . . . glove puppets . . . spinning . . . weaving . . . easy rugs . . . Sumatran house . . . old roses . . . Index (EG10-20).

EG22-23: Australian Access Sourcebook . . . 150 pages . . . Aborigines . . . organic growing . . . permaculture . . . earth building . . . wind . . . solar . . . water power . . . technology . . . water supply . . . access to groups, plans, books, tools.

EG24: Place — 24 new settlers write . . . Mare Carter . . . Ron Edwards . . . Neil Douglas . . . Gundaroo Store . . . Rainbow Region . . . Mt Oak . . . Moora Moora . . . Universal Brotherhood . . . bush ashram.

EG25: Australian Access Sourcebook (Part 2) — 130 pages . . . livestock . . . aquaculture . . . fencing . . . killing . . . tanning . . . food and nutrition . . . grain grinders . . . solar homes . . . methane . . . greenhouse . . . Dorothy Hall.

EG26: The earth-built kasbahs . . . owner built homes in stone . . . timber . . . mudbricks . . . a slab cottage . . . tree felling . . . solar electrics . . . acorns . . . compost dunny . . . quandong . . . pumpkin recipes.

EG27: 100 tropical food plants for Australia (part 1) . . . 16 legumes . . . winged bean . . . pigeon pea . . . lablab . . . cowpea . . . adzuki bean . . . blacksmithing . . . bluestone building . . . wok cooking.

EG28: Tropical food plants (part 2) . . . horse and buggy . . . packhorsing the Alps . . . black sheep . . . Merinos . . . bullocks . . . tamarillo . . . stringybark baskets . . . solar trike . . . persimmons.

EG29: Mudbricks — the monastery at Stroud . . . Bob's bonza brickmaker . . . earth floors . . . curved walls . . . herb roof . . . cutting axe . . . low energy design . . . coconut mats . . . mangoes . . . tropical food plants (part 3).

EG30: Organic growing — compost heaps, pits, trenches, boxes, bins and barrels . . . no-dig . . . mulch carpets . . . semi-arid growing . . . preserving figs . . . tempeh . . . pasta . . . glass bottle windows.

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EG36: Retrn to Nimbin . . . new settlers . . . a woman builder . . , pawpaw plantation . . . solar electric systems . . . potty garden . . . choughs . . . Peru . . . lavender sachet . . . biological building . . . farm structures.

EG37: HARD TIMES . . . making paper . . . newspaper fuel . . . rags to rugs . . . barter . . . slush lamps . . . sawdust stoves . . . Depression dodges . . . hand grain mills . . . 120 household hints.

EG38: Hard Times tucker . . . bread . . . soups . . . yoghurt . . . no-meat meals . . . beer . . . electric grain grinders . . . Gujarati village . . . mudbrick hermitage . . . earth walls and bushfires . . . Noel's island.

EG39: Build Peter Pedal's bike wheel wind generator . . . fire without matches . . . bushfire defensive house . . . avocado growing guide . . . rosehips . . . car battery power . . . farm energy . . . backyard food.

EG40: Communities . . . running a food co-op . . . three in a caravan . . . Scott Nearing's a good life . . . cyder in Tasmania . . . our self-built house . . . earth floors . . . the billy . . . olive oil . . . hares . . . cashew nuts.

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EG42: Earth covered homes . . . Burra dugouts . . . slipform stone . . . the flood-defensive house . . . tomato tips . . . deep ecology . . . build a pigsty . . . EG reader survey . . . the Tuareg . . . Jean Pain's methods.

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EG54: 12V solar lighting and appliances . . . tomatoes . . . chick brooder . . . inverters for 240V appliances for solar systems . . . boring for water . . . festivals.

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